The Nature of Infant Mortality in Norwich and the Effect of Illegitimate Death

Thesis

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The Nature of Infant Mortality in Norwich and the Effect of Illegitimate Death

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Abstract

In this report a hitherto unexplored source reveals the nature of infant death in one District of Norwich. The classic urban pattern of summer diarrhoeal death is an obvious feature. However, in this overwhelmingly artisan suburb the children of skilled workers stood a greater risk of death then their poorer neighbours. Yet it was illegitimate infants who fared the worse. The peculiar phenomenon of illegitimate mortality follows a distinct pattern set apart from the legitimate model. The inflationary effect of illegitimate death outweighed even diarrhoea in serving to keep infant mortality levels in excess of the national average.

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1. AIMS AND STRATEGY

This report aims to show what a particular source type, namely Vaccination Registers, can tell us about the nature of infant mortality in one specific locality. The locality in this instance is Norwich, the city in which I was born and still live. More specifically the research centres on one district of Norwich called West Wymer, the Western half of the city centered on the artisan suburb of Heigham. From the selection of registers available I chose to explore eight, each representing one registration year. These date between 1891 and 1908 and so cover the period during which the national decline in infant mortality is known to have occurred. Although it would have been possible to supplement this source type with a vast array of other local material ranging from a comprehensive collection of local government reports to the 1891 census (spanning some 1,700 pages) the logistics of investigating all potentially relevant local data were simply not surmountable. With the exception of the invaluable MOH reports I decided to concentrate my energy on the one hitherto unexplored local source.

Adopting a questioning sources strategy that follows the continual process of relating researchable issues in wider literature to the available sources, I posed the initial question, what can Vaccination registers as a source reveal about the causes and decline of infant mortality? Following on from this, what features of infant mortality detailed in wider literature are apparent in this data? And can this source type add anything more to the general debate?

Building on my own previous research experience (Coleman, 1995) I found myself asking questions of both the local sources and wider literature relating to illegitimate mortality. How significant in terms of the wider debate are the local findings on the topic? Furthermore is there any indication as to why illegitimate infants had a far higher propensity to die?

The methods used largely involve statistical analysis although a purely quantitative approach is not adopted. The original research contained in this study is very much at the micro level, each individual statistic relates to named individuals. Therefore a reliance on aggregated numbers alone is avoided.

Supplementary Local Information

The following is largely a precis of information taken from Green and Young (1981) During the 19th century the population of Norwich increased from 37,256 in 1811 to 80,368 in 1871 but by then had lost much of its industrial importance. Norwich continued to grow because of the in-migration of workers from rural Norfolk seeking to escape from the poverty of agricultural decline. By 1850 the major Norwich industry of worsted weaving had declined and Norwich was no longer a successful port but with the completion of the railways became an important centre for the distribution of coal. The boot and shoe trade, brewing, ironfounding and the manufacture of soap, mustard, starch, paper and wire were the major industries. Norwich remained an important trade centre for both the local infrastructure with its cattlemarket and corn exchange and for merchants dealing with the colonies.

The living and sanitary conditions of Norwich were uniformly bad in 1850 as a report to the General Board of Health confirmed. The piped water supply was severely limited and came from an unfiltered filthy river. Most people had to use the parish-pumps usually situated in churchyards. There were no sewers, only overflowing cesspools and heaps of night soil. These conditions were the same for the rich and the poor the only major difference being in housing conditions. The poorest people particularly rural migrants lived inside the old city walls in overcrowded slums of tenements, courts and yards. The better paid artisans moved into 'artisan suburbs' outside the city wall and the wealthier built new houses to the south of the city. At this time smallpox was still common, typhoid endemic and tuberculosis 'rampant'.

The first sewer was laid in 1869, the first slum clearance was in 1877 and in 1889 the city acquired the legal power to compel owners of courts and yards to drain, level and pave them. The sewerage scheme was bitterly attacked as being too expensive and because of the city's lack of prosperity progressed very slowly. It was not until after the First World War that living conditions significantly improved for all the city inhabitants.

The West Wymer district (on which this study is based) radiates from the city centre in a westerly direction and centres around the artisan suburb of Heigham. The population in this parish rose from 842 in 1811 to 5932 in 1841. The district was the largest (in population terms) of the five original Norwich districts with in 1873 a birth rate double that of any other district. After 1891 the five districts were merged in to two and West Wymer with the addition of five further parishes became one of these.

2. RELATION TO THE WORK OF OTHER RESEARCHERS

The concept of infant mortality was essentially a mid-Victorian 'invention' created by a new statistical convention. The development of infant mortality as a socio-medical problem is clearly charted by David Armstrong in 'The invention of infant mortality' (1986). The essential measurement of the infant mortality rate (IMR) was first quoted by the Registrar General in 1877, which according to Armstrong 'signified the emergence of a new object of social and medical interest' (1986, p.213). At first the study of infant mortality was given a medical bias, the biological phenomenon of sex differences, the environmental factors of urban sanitation and the link between meteorology and disease (particularly seasonal diarrhoea). However in the early twentieth century when it became apparent that the IMR was beginning to show signs of a persistent decline the emphasis of study of the subject shifted 'from a sanitary into a primarily social one' (Armstrong, 1986 p.218). The new factors

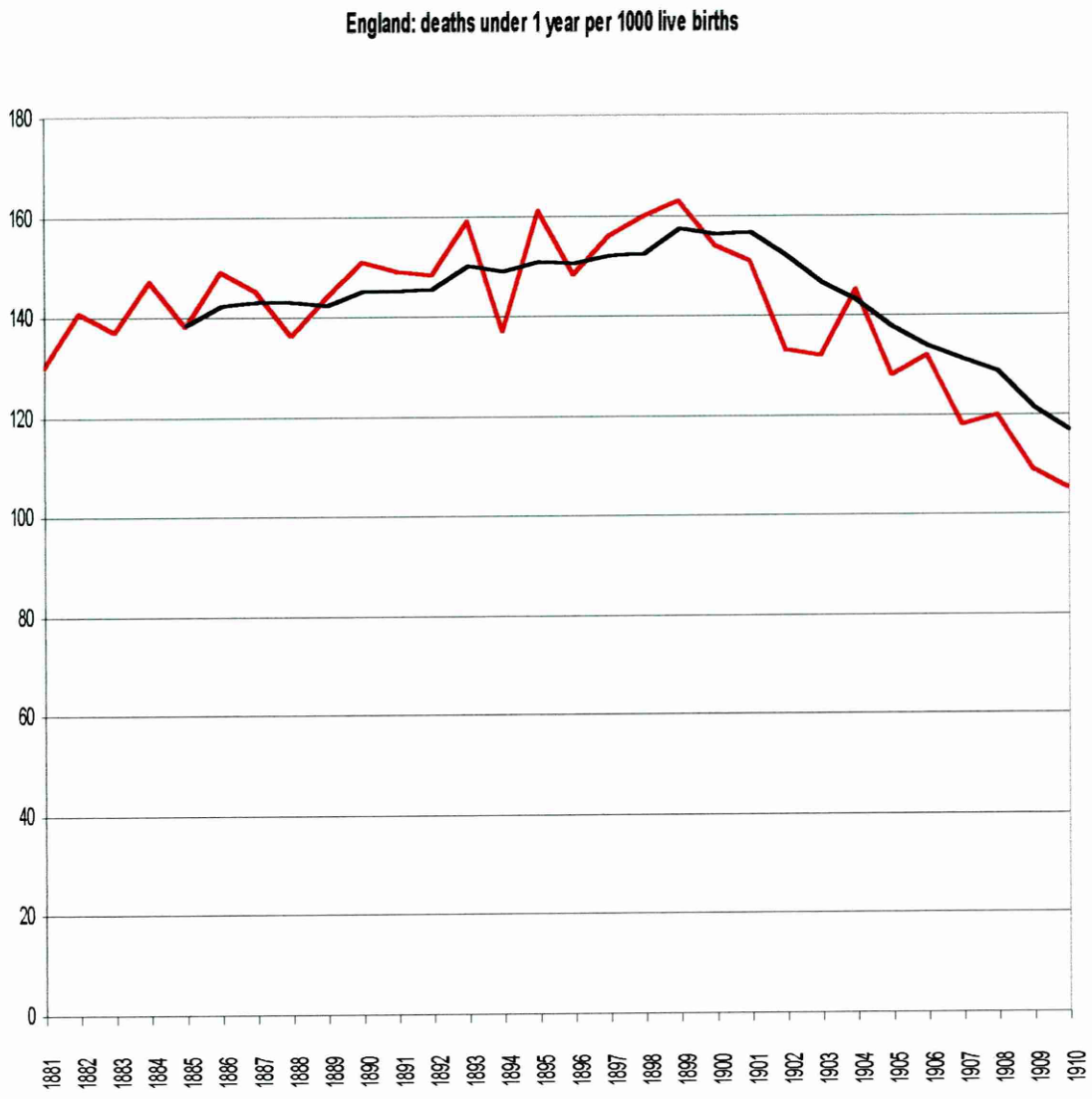
of interest that emerged included 'legitimacy, housing, nutrition, antenatal care, family size, domestic hygiene, educational background [and] social awareness' (Armstrong, 1986 p.219).

The Registrar General

The true starting point for an analysis of the work of research in to the topic of infant mortality must be back in 1877 in the work of the Registrar General. Therefore it is necessary to review this statistical evidence before proceeding to the various debates concerning the subject of infant mortality.

The bare 'factual' data that is the statistical or quantitative background material supplied by the Registrar General is based on civil registration data gathered from 1837 onwards. This shows that infant mortality remained constant through the nineteenth century but dramatically declined in the twentieth century with much of the fall occurring during the first fifty years. The decline can most clearly be seen when the figures are analysed in terms of the moving average of the infant mortality rate (**Figure 1**). This illustrates the consistency of the IMR around the 150 deaths per 1000 live births level from 1881 through to 1900 from which point a steady but persistent decline began.

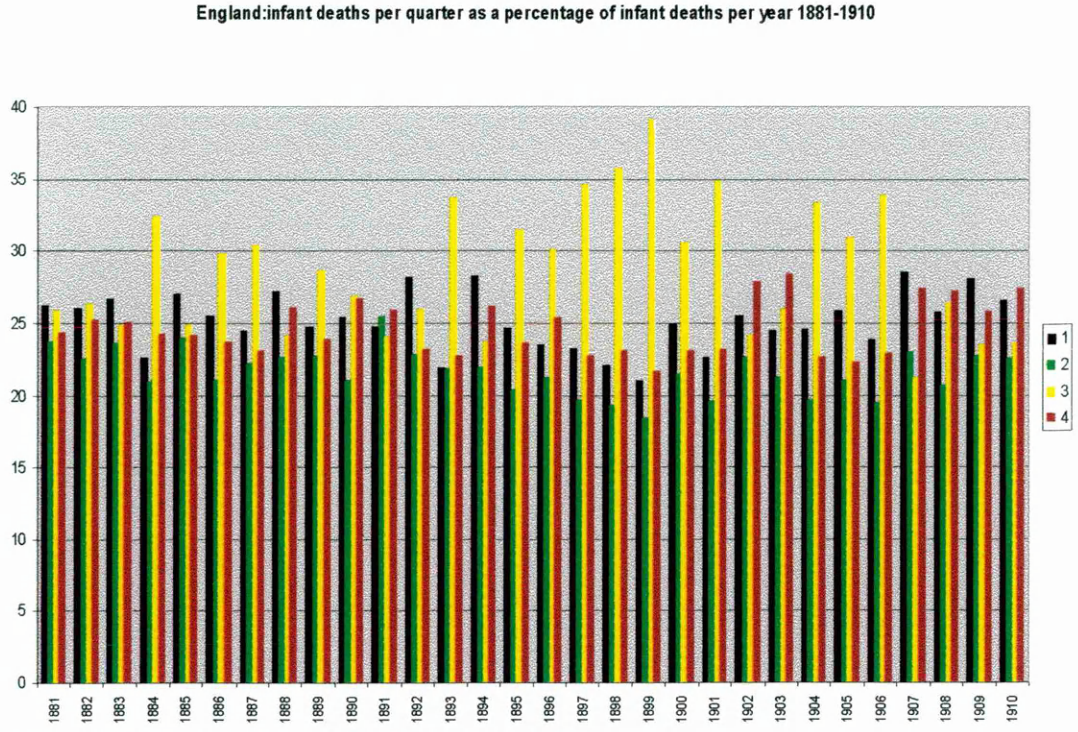
Figure One: The Infant Mortality Rate, England 1881-1910



(Source: The Annual Reports of the Registrar General)

From 1871 the Registrar General published a quarterly breakdown of mortality figures. Presenting the information in this way makes the decline less clear (**Figure 2**). This is largely because of the major seasonal fluctuations particularly the often-dramatic third quarter (summer) peaks.

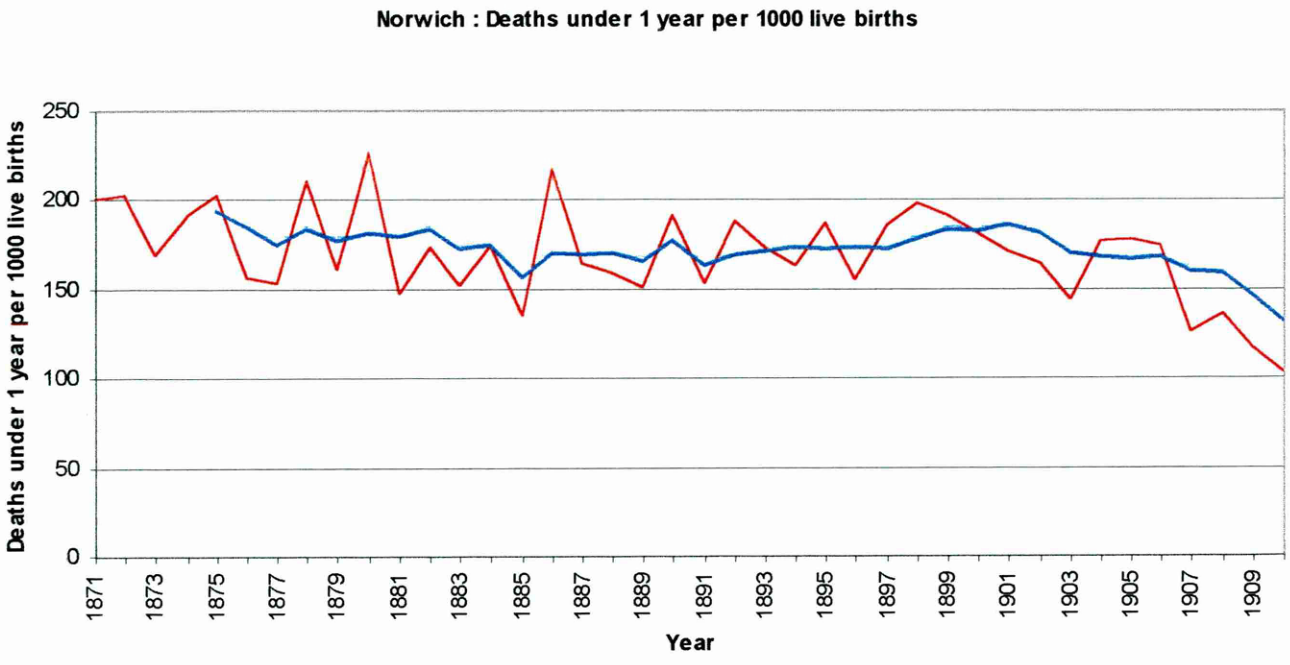
Figure Two: Quarterly Deaths, England 1881-1910



(Source: The Annual Reports of the Registrar General)

The division of the country into approximately 2000 different sub-registration districts for the purpose of civil registration allows for a regional analysis of mortality figures and illustrates considerable variations between different areas. The moving average figures for Norwich (**Figure Three**) show that the IMR in this city was consistently higher than the national average throughout the period although following a very similar pattern of decline.

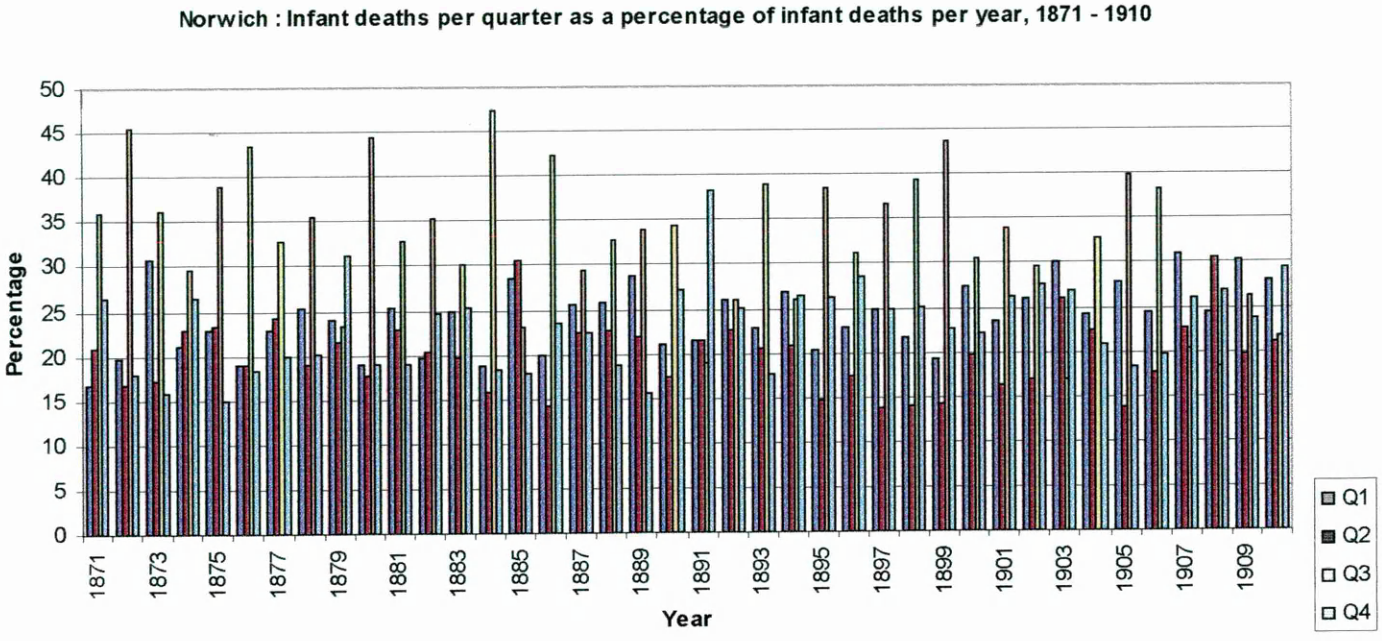
Figure Three Norwich Deaths under 1 year per 1000 live births



(Source: The Annual Reports of the Registrar General)

The quarterly breakdown for Norwich (**Figure 4**) shows some considerable variation in quarterly peaks from the national average. A more startling variation can be seen by looking at the figures for the rural district of Amthill, Shillington and Cranfield (three small adjacent sub-districts in Bedfordshire). The moving average shows not only that the IMR rate for this area was consistently lower than the national average but that the decline started significantly earlier (**Appendix 1**). Again in this area there is considerable variation in the extent and occurrence of quarterly peaks (**Appendix 2**).

Figure Four Norwich Infant Deaths Per Quarter



(Source: The Annual Reports of the Registrar General)

The Medical Officer of Health

The statistical evidence supplied by the Registrar General was investigated at a more local level by Medical Officers of Health who rapidly became leading 'experts' on the subject of Public Health within their particular area. They could not and did not overlook the particular subject of infant mortality although this was by no means the primary concern of all those appointed to this role. In the journal of the Society of Medical Officers of Health entitled *Public Health* the subject of infant mortality was a regular feature. For example, in 1908 and 1909 the MOH for Rotherham, Alfred Robinson, produced an evaluation of the benefits of the Midwives Act (1902). These two articles illustrate Armstrong's point about the emphasis of the study of the subject shifting 'from a sanitary into a primarily social one' (Armstrong, 1986 p.218). There appears to be no doubt in Robinson's mind that the only way to curb 'the alarming infantile mortality in our large towns' (Robinson 1908) is through direct social intervention. He asserts that it is vital to lower the mortality rate of infants because 'with every birth rate in this

country yearly diminishing every birth is of the utmost importance to the State' (Robinson 1908, p.22). He describes a public crusade to reduce infantile mortality by providing qualified medical assistance at births (through a system of trained midwives) and more importantly to educate 'ignorant' mothers through a system of female health visitors. The crucial points that Robinson illustrates (largely with statistical evidence from his own district) are the importance of breast feeding, maternal health, domestic hygiene and nutrition.

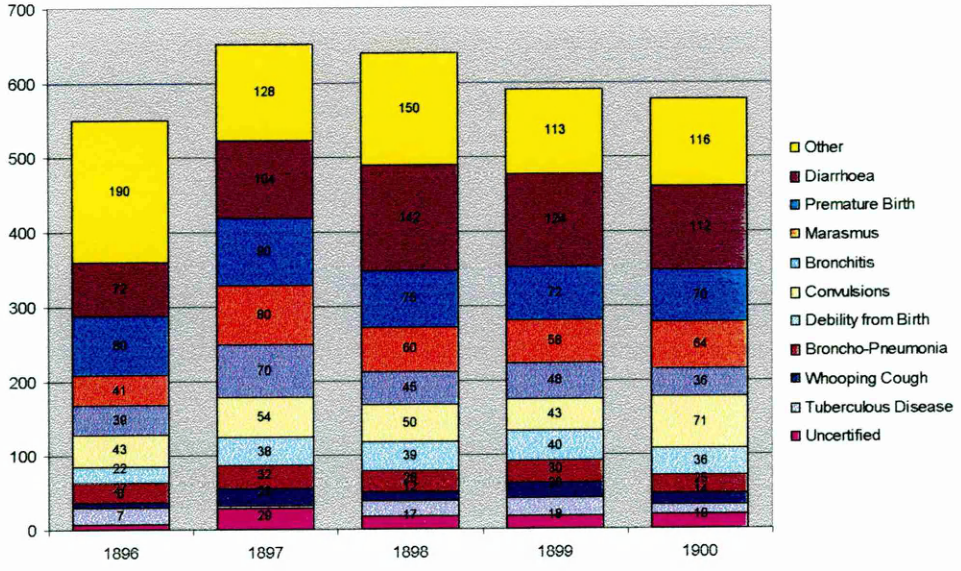
The work of two Medical Officers' of Health in particular became recognised as being of national importance. Sir Arthur Newsholme was the Medical Officer of Health for Brighton between 1888 and 1908 before becoming Chief Medical Officer to the Local Government Board for the London Districts between 1909 and 1919. Sir George Newman (1870-1948) was the MOH for Finsbury (1900-07) and became Medical Officer of the Board of Education (1907-35) and the Ministry of Health (1919-35). Numerous researchers such as Woods, Watterson and Woodward (1989) and Mooney (1994) have undertaken reviews of the work of these two men and this is discussed below in the section on modern research. However it is important to note that Newman entitled his published volume on the subject, *Infant mortality: a social problem* (Newman 1906) again emphasising Armstrong's point that by the early twentieth century the emphasis of the blame for the problem had shifted. In a micro level study such as this one, the work of the local MOH cannot be overlooked and the reports produced by the Norwich Officers before the turn of the century clearly illustrate the earlier emphasis on meteorology, disease and sanitation.

In Norwich the first Medical Officer of Health Thomas Crosse was appointed in December 1872 and presented his first report in April 1874. From the outset the issue of infant mortality was his major concern. Having been a Medical Officer of the Norwich Union for over twenty years before taking up his post, the MOH felt qualified to judge why such a high proportion of deaths (24% at the time of writing)) were of infants under a year. His opinions show that

some MOH were beginning to be tuned in to the social problem debate well before 1900. In words clearly echoed later by men such as Robinson (1908 and 1909) Crosse puts the blame for high infant mortality squarely on 'ignorance among the poorer classes of the proper way to rear their infants'. This 'ignorance' included poor nutrition, cleanliness, clothing, ventilation and worst of all the use of opiates (known as cordials). He states that certain infantile diseases particularly marasmus had a proven link with the use of these substances. Marasmus was a wasting disease, which was given as the disease of death in 25% of infants in the initial report and as such the biggest single cause.

However, by the 1890s the MOH reports for Norwich had a very different style. The MOH in this period was Harry Cooper Pattin a Cambridge medical graduate with a strictly business like approach. The reports of the 1890's adopt a standardised format with whole passages remaining unchanged from year to year. The emphasis is on meteorology (the temperature and rainfall levels throughout the year are given), the incidence of infectious disease and the work of the sanitary committee. Although a section of each report is devoted to the topic of infant mortality Cooper Pattin appears to take much less of a personal concern with the subject than Thomas Crosse. In each report a list of the certified causes of death and the number of infants affected is followed by four standardised paragraphs that are repeated word for word every year between 1896 and 1900 (only the figures quoted are altered annually). These paragraphs state the MOH's concern that all deaths should be properly certified and doctors should be encouraged to take greater care over the cause of death stated. He particularly dislikes the 'vague' terms marasmus, want of vitality and inward fits, which are 'singularly uninforming phrases'.

Figure Five: Leading Causes of Infant Death as Reported by the MOH, Norwich 1896-1900



(Source: The MOH Reports for West Wymer)

As **Figure 5** shows, by examining the leading causes of death in each of the years it is clear that Cooper Pattin has a point when he demands a more careful and consistent system of death certification. The oversimplification of classifications of infant deaths under terms more accurately described as symptoms than causes is obvious (e.g. marasmus, prematurity, convulsions, debility). What this illustration does not show is that in the myriad of terms (in excess of fifty) combined for practical reasons in Figure 5 as 'others' terminology is equally vague and far more inconsistent. Whilst instances of particular diseases such as measles and whooping cough would be expected to vary from year to year in other cases terminology appears to be subject to fashion. For example, in 1897 Temporal Abscess was given, as the cause of 17 deaths but is not listed at all in any of the other years.

Amidst all the scientific and sanitary emphasis of Cooper Pattin's reports there is an indication that he too believes that public health is by no means the only issue of concern. He annually states that the 'ambiguous' term marasmus should largely be replaced by 'improper dieting' caused by 'the ignorance of the hygiene of infant life so lamentably prevalent in otherwise affectionate mothers'. However, aside from this repeated eulogy Cooper Pattin adds only a comparison of the annual IMR for the city with the preceding year's figure and with the

average figure for the 33 great towns interchanging the words gratifying and not gratifying as appropriate. From 1897 the reports on infant mortality finish with a statement of the percentages of dead infants who were insured (see **Figure Six**) without explaining why this might have been considered important.

Figure Six: The Percentages of Dead Infants Insured, Norwich 1897-1900

1897	1898	1899	1900
47%	51%	56%	44.2%

(Source: The MOH Reports for West Wymer)

Modern Debate

The 'McKeown debate' is often used as the starting point for a review of modern research. However although deemed a leading expert on population demographics McKeown (1976) had no specific interest in infant mortality and failed to recognise it as a separate entity from general mortality trends. McKeown (1976) centres on the view that although improvements in public health were generally believed to be responsible for the overall mortality decline his research proved this to be inaccurate. He argued that his findings proved that direct intervention played only a minor role and that mortality declined in line with increases in living standards and particularly nutritional improvements. If McKeown's account is true then all the best efforts of Victorians and Edwardians to overcome insanitary urban squalor, ineffective medical provision and widespread ignorance of how to rear infants was unnecessary for in the end it was an 'invisible hand' that conquered infant mortality.

McKeown's assertions were supported by Guha (1994) but opposed by Szreter (1988 and 1994) in a series of articles published in *The Social History of Medicine*. Szreter (1988) claimed that McKeown's evidence was not interpreted accurately and his causation arguments were flawed through an unsound elimination process. Szreter maintained 'the argument is not that improving nutrition and living standards were entirely unimportant in accounting for the mortality decline, but that the role of a battling public health ideology, politics and medicine

operating of necessity through local government, is more correctly seen as the principal causal agency involved' (Szreter 1988, p.36). Guha (1994) argued that it was Szreter's arguments that were flawed particularly with regard to infant mortality because 'changes in the population's resistance to infection rather than changes in its exposure to it were the source of the reduction in mortality' (Guha 1994, p.113). In other words direct intervention failed to reduce the incidence of disease but rising living standards and improved nutrition did improve people's chances of survival particularly the weakest and most at risk.

However, Szreter is not alone in attacking McKeown or pointing out the methodological flaws in his interpretation of the empirical evidence. Woods *et al* (1988) produced an equally scathing attack in the same year criticising McKeown particularly for failing to focus on infant mortality. However, Woods *et al* conscientiously develop the study of the infant mortality decline though an analysis of fertility decline, socio-economic differences and the urban-rural divide particularly the urban-sanitary-diarrhoeal effect (see below). They also take the time to review the contemporary opinions on the subject by examining the work of both Newman and Newsholme.

The Direct Intervention Debate

Szreter (1988) claimed that direct intervention in domestic hygiene was unsurprisingly the 'last frontier' for the public health movement and that this prevented infant mortality falling as quickly as mortality amongst older children and adults (which fell because of strategic improvements in the urban environment outside the home). The 'mood change' towards direct social intervention in the home has already been seen in the work of the MOH (see above) and there is no doubt that the Victorians and Edwardians themselves came to believe that this was where the answer to the problem of eradicating infant mortality lay.

Amongst modern researchers the importance of direct intervention measures has received a mixed reaction. Mooney (1994) investigates this aspect of Newsholme's contemporary research. Newsholme believed the answer to the seasonal problem of infant mortality was control though 'personal and domestic hygiene'. Public methods of improving hygiene and poverty he believed were simply too expensive and impractical. This belief Mooney suggests was shared by other authorities and led to an emphasis on personal and domestic measures. An indication of this was the Notification of Births Act (1907). This led to a system of health visiting designed to educate mothers in personal hygiene and effective child-care. Although recognising the importance placed on such measures by other researchers such as Dwork (1987) Mooney maintains that 'this system was flawed in both its operation and extent' (1994, p.169). The implementation of the health visiting system was largely left to local discretion and its effectiveness limited by the finances and enthusiasm of these authorities. Furthermore, Mooney continues there is strong evidence of working class resentment of this kind of 'interference'.

Dyhouse (1978) explores contemporary attitudes towards working class mothers and largely echoes Mooney's findings. She focuses on Newman's attitudes to infant mortality which share Newsholme's belief in the dangers of the domestic environment and placing blame on maternal ignorance. Dyhouse goes on to say that this attitude did not persist beyond World War 1 largely because the statistical evidence did not support it. She also looks at Newsholme's attitude to working mothers and how despite his hardest efforts to prove that this was a causal factor of infant mortality the statistics proved that largely the reverse was true (the advantages of the increased standard of living outweighed even the protection of breast-feeding). She concludes by saying that the impact of the welfare movement cannot be assessed without evidence of working class methods of infant care. Contemporary evidence does not help because of the middle class writer's 'accusatory rather than descriptive' style

'they tell us more about the viewpoint and values of the observer than about those being observed' (Dyhouse 1978, p.262).

Dwork (1987) espouses the health visitor's 'unique and lasting contribution to infant welfare work' drawing on the ability of France to dramatically reduce its infant mortality rate though the intervention of regular medical visits. In contrast, Lewis (1980) states that despite contemporary claims of a direct link to falling mortality 'it is impossible to determine' how effective developments in infant welfare services actually were. She states that very few women made use of such services before the First World War and so the reduction of infant mortality is likely to have been the result of 'a better quality milk supply and better living standards' (Lewis 1980, p.464). Thus, her analysis of direct intervention measures leaves her firmly if unintentionally in the McKeown supporter's camp. Although of course Szreter would argue that the milk supply was only improved through local public health measures.

The most comprehensive recent study in the field of direct intervention in the lives if not the homes of individuals is that of Williams (1994). This study looks at the effects of compulsory health legislation and particularly the system of compulsory infant vaccination against smallpox introduced in 1853. Williams states that such methods were 'highly controversial, overriding an individual's right to choose for the good of the wider community in the name of public health' (Williams 1994, p.396). She quotes the fourth annual report of the Registrar-General (London 1842) which provided an analysis of the first available statistics showing the effect on mortality of a smallpox epidemic. 'In 1839 one half of all smallpox deaths occurred in London and 24 large towns. In these areas smallpox accounted for up to 10% of all deaths, but among those under five years of age the proportion was over 80%' (Williams 1994, p.397). It was this statistical evidence together with the simple fact that this was the one disease that could be controlled by a specified interventory method, which compelled the government to take action to ensure vaccination against it. The initial voluntary system established in 1840

proved ineffective and the Government deemed it necessary to make vaccination compulsory to 'overcome apathy and indifference' (Williams 1994, p.398).

Williams proceeds to investigate how opposition to this legislation affected the numbers of infants vaccinated and how effective it was in preventing deaths from smallpox. Her sources for this information are the Annual Reports of the Poor Law Commissioners (and their successors). Her findings indicate geographical differences in the implementation of the legislation, opposition to it and the proportions of infants vaccinated. In particular there was 'a marked difference between urban, industrialised counties on the one hand, and agricultural areas on the other' (Williams 1994, p.401). Vaccination rates were higher in areas most severely hit by previous epidemics (the larger cities) and so were lower in rural areas. The Vaccination Act required infants to be vaccinated in the first three months of life (four months for legal guardians) to overcome delayed vaccination practises common in areas with a lower perceived threat from the disease. Initially the act had a significant impact on increasing the numbers of infants vaccinated, doubling from 300 infants per 1000 births to over 600. This level subsided to the 500 mark in the 1850's and lowered further to 450 in the 1860's. A tightening of legislation in 1867 and 1871 caused a temporary improvement with rates falling again in the 1880's and 90's with the rise of the opposition movement.

Williams concludes that the IVR is 'a fairly sensitive reflection of popular feeling towards vaccination' (Williams 1994, p.403) leading to geographical differences further extended by the commitment of local authorities in pursuing the unvaccinated. Nevertheless the majority of infants continued to be vaccinated at least until the 1880's. The 1871-2 smallpox epidemic proved that vaccination worked reducing both the attack rate and the mortality rate. However, 'other contributory factors clearly played a role, for instance the level of urbanisation and the effectiveness by which authorities were able to isolate infectious cases' (Williams 1994, p.406-7). Proportionally infants fared better during this epidemic because the

vaccination legislation's concentration on this age group. Revaccination was technically necessary every twelve years to maintain immunity but this was neither legislated for nor otherwise pursued. Williams' final conclusion is that after the introduction of legislation in Britain 'smallpox mortality was substantially lower than in other European countries without systems of obligatory vaccination' (Williams 1994, p.409).

Fertility Decline

Woods *et al* (1988) valiantly undertake an investigation of the demographic conundrum of the relationship between fertility decline and mortality decline. Whilst the contemporary researchers Newsholme and Newman dismissed the link for ideological reasons modern researchers have largely failed to prove the common belief that declining infant mortality caused fertility to decline. Woods *et al* (1988) propose the hypothesis that the decline in fertility caused a decline in infant mortality because the increased gap between births improved the survival chances of infants. It seems logical to infer that the fewer children a woman had (and the greater the gap between births) the more time, money and energy would be available to care for each individual child. However, whilst Woods *et al* are able to produce some statistical evidence to support this theory they state that this is not conclusive and furthermore there may well be some other factor influencing both the infant mortality and fertility declines.

It is perhaps this difficulty in proving any conclusive link between fertility and mortality that causes many researchers to ignore or mention it only in passing. Others fall back on the conundrum of fertility decline as a last possible solution to the infant mortality puzzle (when their own research has failed to do so). Williams and Galley (1995) conclude their study of Urban-rural differentials in Infant Mortality with the assertion that the 'triggering mechanism' for mortality decline lies in the relationship with fertility. The 1911 census is often quoted as an essential measure of marital fertility and its effect on infant mortality although this largely translates in to a socio-economic debate.

The Socio-economic Debate

In their analysis of the 1911 fertility census Garrett and Reid (1995) claim that the crucial factor that affected infant mortality was the living environment not social class or economic status. Watterson (1988) used the published aggregate data from the 1911 census to explore the relationship between infant mortality and paternal occupation and found that 'urban occupations saw the most dramatic falls in infant mortality'. She argues that the positive effects of improvements in urban sanitation and public health may have been enhanced by high or regular income. However, income by itself was not enough to cause a significant improvement in infant mortality as could be proved by her study of mineworkers.

Haines (1995) also used the 1911 census to explore the effects of socio-economic differentials on infant mortality concentrating specifically on the period of decline between 1890 and 1911. He did this by relating the three factors of income, urbanisation and fertility to infant mortality levels and trends for detailed occupational groups. He found that mortality was lower amongst children of the highest socio-economic status and for those children living in houses with the most number of rooms. Likewise mortality rates for infants in this group declined more rapidly than any other group but not to such a great extent as might be expected. Haines also found that 'income was virtually unrelated to the pattern of mortality decline' (Haines 1995, p.315) but that there were variations between occupational and social class groupings in the timing of the decline. In failing to find a consistent causative link between mortality and socio-economic factors Haines alludes to urbanisation and public health measures as possible solutions.

The Urban-Rural Divide

Given the startling third quarter peaks and the regional variations in the civil registration data it is perhaps not surprising that the most convincing recent arguments promoted by researchers in the field of infant mortality have centred on the effect of urbanisation and particularly the summer diarrhoea factor. Woods *et al* (1988, 1989) claimed that the infant mortality rate was maintained and prevented from declining sooner because of the disproportionate influence of the larger cities. In particular the climate of the last decade of the nineteenth century combined with urban sanitary problems to cause the spread of diarrhoea and related diseases that kept the IMR inflated. If the urban sanitary effect were discounted then the national IMR would have started to decline from the late 1880's (as it did in some rural areas and in other European countries).

The conclusions of Woods *et al* have been criticised at least in part by Lee (1991). Lee disputed the idea that infant mortality uniformly declined at the turn of the century. His analysis on a county level showed regional variation in the start of the down turn. Lee found that the mortality rate actually started to fall as early as 1861 in some counties and in the majority of regions no later than 1871.

The urban-rural debate was continued by Williams and Galley (1995) who in reviewing research to date stated that 'a number of recent mortality studies have attempted to put geography back into historical demography, mainly in response to the inadequacies of nation-based studies such as McKeown's' (p.401). They proceed to put the conclusions of both Woods *et al* and Lee to the test. They question Lee's use of three year averages based around census years and his dismissal of rural-urban differentials but accept that the downturn in mortality may have started earlier in some areas than others. They highlight the Woods *et al* emphasis on large industrial cities as another potential weakness promoting the need to explore the effects of urbanisation on smaller cities and their hinterland. Examining the vital

statistics for three different groups of registration districts continues this study. These include, an urban group consisting of seven towns with populations over 50,000 (including two with over 100,000), an urban hinterland group consisting of districts bordering the above towns and a third group of rural areas and small market towns.

According to Williams and Galley their findings serve to illustrate the 'futility of relying on the national trend as a descriptive tool for untangling the factors which led to the eventual decline of infant mortality'. In fact, they say the national trends are 'little more than a meaningless amalgamation of patterns, masking the wide range of infant mortality conditions experienced by mid to late nineteenth-century communities' (1995, p.407). They found not only wide variations in levels of mortality but in the overall patterns. Their research shows evidence in the larger towns to support the Woods' *et al* theory of the 1890's diarrhoea effect and of Lee's contention of mortality decline as early as 1860 in some areas. Their findings show that the urban-rural divide was the overriding factor in explaining the geographical differences in infant mortality. Williams and Galley's analysis of cause-of-death data revealed that diarrhoea and related diseases killed eight times as many urban infants.

In their conclusions Williams and Galley concentrate on what their sources and methods do not tell them. Drawing up two models that show the influences that affect infant health and nineteenth century child mortality. The range of economic, social, environmental and political influences on factors affecting the life, and potentially contributing to the death of, infants are largely unquantifiable and difficult to interpret. Furthermore, it is extremely difficult to decipher how improvements in the life and health of infants contributed to the mortality decline and whether any of these could actually be said to have been causal factors.

Graham Mooney contributes to the urban-rural divide debate by moving away from sole reliance on statistics to an examination of the work of the MOH particularly in this London study, of the Chief Medical Officer to the Local Government Board for the London Districts, Sir Arthur Newsholme. In the London districts the summer diarrhoea factor was a primary concern that led to much debate on how to improve childcare and domestic hygiene.

Drawing on the Woods *et al* argument of the deadly combination of poor sanitation and climatic conditions, Mooney identifies two crucial factors, breast-feeding and environmental management. Warm temperatures exacerbated disease spread by flies and to a greater extent where, artificial feeds were used and sanitary conditions poor. The sanitary conditions of London were generally better than many of the large British towns because of a 'comprehensive water-closet system' introduced in 1855 and indeed led to favourable comparisons in the IMR. Yet the seasonal effect of infant mortality could not be eliminated largely because of poverty. Newsholme drew on his work as the MOH for Brighton where he carried out a detailed study of methods of infant feeding between 1903 and 1905. This study proved a relationship between artificial feeding and deaths from epidemic diarrhoea. Newsholme took this further arguing that because a significant proportion of infants dying from seasonal diarrhoea were breast fed then milk alone could not be the culprit.

Mooney's research of the London districts shows that even where public sanitary measures were implemented that is, in areas with a clean water supply, efficient removal of refuse and where thoroughfares were paved, the detrimental effects of poverty could not be eliminated. He identifies the major problem as being overcrowding. The sharing of the water supply and the water closet amongst too many people living in confined conditions in close proximity rendered domestic cleanliness impossible. Mooney's conclusion is that 'sanitary reforms, followed by maternalism, ultimately failed to secure a safe public health for the most

disadvantaged members of society' (1994, p.172). He adds the qualification that 'the tangible benefits of the sanitary revolution are notoriously difficult to quantify'.

Illegitimate Mortality

In his 1878 report the MOH for Norwich, Thomas Crosse stated:

'Another point to be noted is the increase in deaths amongst illegitimate children, and the proportion they bear to the number of births year by year: -

Year	1876	1877	1878
Born	228	225	215
Died	65	78	109

The figures quoted by the MOH indicate that in 1878, 51% of illegitimate children died. Whilst Crosse gives no explanation for this phenomenon he does illustrate that contemporaries were well aware of the problems of illegitimate mortality long before the Registrar General made this an official statistic. The later MOH for Norwich, Cooper Pattin made only one mention of the topic and that was in the preface to his 1900 report. He states only the number of illegitimate infants born and dying during the year representing a death rate of 285 per 1000 (in excess of a quarter of all illegitimate births).

The Registrar General did not start to produce a regular breakdown of infant mortality in terms of legitimacy until 1908. This according to Armstrong (1986) followed on from a report by the Interdepartmental Committee on Physical Deterioration of 1905 that noted the link between illegitimacy and high infant mortality. Armstrong sees this development as part of the sea change in attitudes towards infant mortality from being a matter of public health to being a social problem.

Amidst many modern researchers the subject of illegitimate mortality is like fertility decline largely ignored or mentioned only in passing. This to some extent can be excused by the limitations of the sources used, for example the 1911 census relates only to marital fertility and so largely excludes illegitimate births. The ever-conscientious team of Woods *et al* does not pass the subject by although their analysis of it is limited and largely unclear. They firstly state that 'mortality of illegitimate children was always much in excess of that of legitimate' (1988, p.352) they do not state their evidence for this point. They also claim that in urban areas illegitimate children faced 'doubly accentuated hazards compared with legitimate rural births' but in terms of neonatal mortality fared the same as their legitimate urban counterparts. The logic behind this point is somewhat confused, why compare urban illegitimacy with rural legitimacy and then state that within the urban environment there was little difference?

In Part II of their work Woods *et al* place illegitimacy in the context of Newman's belief in the relationship between the birth rate and infant mortality for this somehow proved that mortality and illegitimacy were connected (this point is not explained). They also state that illegitimate fertility declined with marital fertility from the 1870's and had the same beneficial effect on an infant's chances of survival.

The only other researchers in the field of infant mortality to have expressed an interest in illegitimacy are those interested in infanticide. Sauer (1978) states that inquests on infant deaths were proportionally greater amongst illegitimates and in both rural and urban areas the mortality rate for illegitimate infants was substantially higher. However Sauer admits that the availability of statistics on illegitimate infant death is severely limited. The effects of the 1834 and 1844 Poor Law Acts increased the economic hardship of single mothers increasing speculation in the relationship between bastardy and infanticide. However Sauer does not

offer any evidence to support this assertion and in fact weakens the argument by restating the contemporary belief that working mothers had a detrimental effect on their children's chances of survival (the fact that the reverse was actually true has already been illustrated). Other common beliefs quoted by Sauer include that there was a connection between insurance of infants and infanticide (perhaps the reason behind the statistics quoted in the late 1890 MOH reports for Norwich, see **Figure Six**). Furthermore, that mothers were more likely to kill their infants through neglect (both intentional and non-intentional) than by actual bodily harm.

Higginbotham (1989) echoes much of Sauer's speculation on the connection between illegitimacy and infanticide. She quotes from the 1871 Select Committee on Infant Life Protection that speculated that as few as 10 per cent of illegitimate children survived in to adulthood. She believes that the Victorians exaggerated the problem of infanticide to mask the real causes of illegitimate death namely economic hardship, poor nutrition and improper care. She continues this point further by stating that the Victorians deliberately did nothing to improve the life of illegitimate infants because 'infant deaths were more readily tolerated than easy virtue' (Higginbotham 1989, p.337).

On the 'other side of the coin' researchers of illegitimacy have also largely ignored the subject of illegitimate infant death even the leading authority on the subject Peter Laslett. There have however been some studies of the illegitimate fertility decline. Schellekens (1995) asserts that studies of illegitimate fertility decline have been limited and largely untested. His own research adds weight to the hypothesis that much of the decline in illegitimate fertility was caused by a rise in working class prosperity although an increased knowledge and more widespread use of contraceptive methods also played an important role.

The Call for Micro Level Studies

A common plea among researchers responsible for much of the literature concerning the decline of infant mortality is the need for local micro level studies. Aggregate national statistics even when broken down into the 2000 sub-registration districts are limited in what they can reveal. The wide variations between localities cannot be explained at the macro level. A study of a small area or community can illuminate the factors affecting individuals, the differences and similarities of children living or dying in close proximity can reveal hitherto unexplored evidence or add weight to existing aggregate based arguments. Williams (1992) appears to be the only researcher to even attempt a local study using nominal record linkage a technique now so commonly applied in other areas of socio-historical investigation.

The final words of Williams and Galley (1995) assert that, the only way to investigate the subject further is through 'locally-based micro-level studies' (p.420). The parting note is their belief that the key to further enlightenment lies with the civil birth and death registers if they were to be made accessible to researchers. The existence of the vaccination registers which are effectively copies of the birth and death registers, which have survived in a number of areas, and, are open to investigation is a fact overlooked in all literature to date. In William's (1994) detailed analysis of the compulsory vaccination legislation, aside from mentioning that from 1871 all districts were required to appoint a Vaccination Officer she does not question the sources of the aggregate data she is using (the Annual Reports of the Poor Law Commissioners).

Mooney (1994) also devotes his final words to a call for local level study. He suggests combining sub-district IMR data with MOH reports. Although many researchers quote the views of Newsholme and Newman only Mooney appears to recognise the value of the MOH reports as a rich and widely available printed local source. These vary in content and emphasis

but generally include contemporary statistical analysis of many factors affecting infant mortality including: sanitation, public intervention, socio-economic variables, the prevalence of disease, an examination of local institutions such as hospitals and workhouses and local customs in relation to childcare.

3. DESCRIPTION AND EVALUATION OF SOURCES AND METHODS USED

A literary review of the subject of infant mortality reveals a heavy reliance amongst researchers on two sources. These are both official statistical sources created by the General Register office. The Reports of the Registrar General are the most prolifically used source of all but some researchers such as Haines (1995) have used the published results of the 1911 Census. Few researchers have gone beyond these official sources although some such as Mooney (1994) have recognised the value of local sources such as MOH reports. With the exception of Williams (1992) very few studies based on local records have been carried out in this field. In this section I will evaluate the primary sources used in this project.

The Registrar General

The statistics that created infant mortality came into being through the introduction of civil registration in England and Wales in 1837. From this point, the Government took control of the registration of births, marriages and deaths and for the first time comprehensive demographic data could be analysed centrally. For registration purposes England and Wales was divided in to approximately 600 Registration Districts that in turn were sub-divided in to about 2000 sub-districts. The boundaries of the districts changed regularly and the number fluctuated in line with population changes. Aggregate data at the Registration District level was published in the form of *Annual Reports of the Registrars General*. From 1871, the General Register Office began to publish *Quarterly Returns of the Registrar General* with data broken down to sub-registration district level. 1871 can be said to be the point at which, the concept of

infant mortality was created. For the first time, statistics of deaths were analysed in age bands with infants under one year of age identified as a distinct group.

The value of this primary source lies in its official nature, universality and consistency. Information was gathered in a standard format at the local level and collated centrally where it could be effectively analysed. The whole population was included allowing for national trends to be identified. The data was also broken down in to smaller geographical areas so that regional variations could be seen.

Initially the data may not have been wholly reliable particularly in terms of its universality. At first, some general opposition, misunderstanding and teething problems make it likely that a small but significant proportion of the population escaped registration. The legal burden to register births and deaths was not placed on the individual until 1874, before that, it was only illegal to refuse to supply information when asked by an official.

The main disadvantage of this primary source lies in its aggregate nature. Although registration details were gathered at the named individual level they are only generally available in the impersonal collective form. Individual certificates can be purchased but only the indexes and not the registers themselves are open to public access (unlike Scotland). The General Register Office processed the gathered data as it saw fit and there was certainly an element of choice in how this was done. In using this information we rely wholly on what a state official has chosen to tell us and while there is no suggestion that the figures are falsified in any way, they have to an extent, been manipulated. If the raw data were open to researchers then it would be possible to analyse it in many different ways with no doubt a greater variety of results and emphases.

The 'invention' of infant mortality through national statistics has in the past led to some over generalisations and myths about the level and particularly the timing of the downturn in the death rate. Aggregate data and trends can mask local and regional variations and do little to help identify causal factors. As Williams and Galley (1995, p.407) put it, the published national figure are 'little more than a meaningless amalgamation of patterns, masking the wide range of infant mortality conditions experienced by mid to late nineteenth-century communities'. Whilst the sub-division in to districts does serve to overcome the problem of over smoothing of data to some extent, in so doing it imposes artificial boundaries not representing any real sense of 'community'. In terms of serving to identify causes of infant mortality most researchers agree, only specific local level studies can reveal any further information on the subject.

Mooney (1994, p.159) identifies some particular problems with using this data as a source. In his analysis of London, constant alteration of boundaries of registration districts caused some difficulties. Additionally, the location of workhouses and hospitals caused some distortion of the death rate in some areas, particularly as, 'the mortality data of the Quarterly Returns were not corrected to account for usual place of residence of the deceased until 1912'.

However, it would not be sensible to fail to use the reports of the Registrar General as a primary source for this project. The statistics included in this data provide a barometer beside which the more specific local data can be analysed. The consistency of the data is important because sources of a more local nature are not available for the whole time period of interest. The Registrar's quarterly figures can be used to give an indication of levels of mortality where there are time gaps in other source data. In the same way that this national source can be used to illuminate local data the reverse is also true, local sources may also be able to highlight variations within the community that the aggregate data tends to smooth over.

The Vaccination Records

Laws that made the inoculation of all infants against smallpox, compulsory, were passed as early as 1853. However, it is from 1871 when the appointment of Vaccination Officers was made compulsory, that comprehensive records (necessary to ensure that no infant escaped vaccination) are available. A full account of the history of vaccination legislation can be seen in Williams (1994).

In order for the Vaccination Officer to find all the children in his area he was supplied with 'returns' of all the registered births and deaths in the district by the District Registrar. These returns were effectively copies of the civil registers. The death returns included all deaths (not just those of the infants) and details of date and place of death, name, sex, age and rank (or occupation) of the deceased and the cause of death. The birth returns included date and place of birth, name and sex of the infant, the father's name and occupation and the mother's first and maiden names (in the case of illegitimate children the mother's occupation is given).

The information on infants less than one year old was transferred to a Vaccination Register. This was organised according to the month of registration (not birth) and included the infant's full name and place of birth, the father's name and occupation (or mother's if illegitimate) and either the date of vaccination or death. Alternatively the child was required to have a certificate of insusceptibility or of having had smallpox. Conscientious objection to the vaccination was not legally permitted until 1898. A list of all infants (under one year of age) who died during each month of the year was attached to the register at the end of each month of birth registrations. The list of dead infants included those that died but were not born in the district and those that died within institutions located in the district but that actually lived in other districts. The details of deceased infants included date and place of death, name, sex and age of deceased and father's name and occupation (or mother's if illegitimate). It also

included the birth registration number, if the child was born in the district or place of birth if born elsewhere.

Details of infants who avoided vaccination for reasons other than death (such as moving out of the district) were usually noted separately in a Vaccination Officer's Report Book. Some Vaccination Officers also kept a separate register that listed only successful vaccinations.

The prime advantage of this source has to be its unexplored potential, comparable perhaps to allowing open access to the civil registers. The records are based on the civil registration system and share the same comprehensiveness covering the whole population. Furthermore, nominal linkage between births and deaths of infants has already been done because the birth register number is given on the monthly infant death register.

The prime disadvantage of this source is that unlike the civil registration system, records were not collated and stored at a central point and no copies were made. The major problems then, are firstly, the survival rate and secondly, location. The local emphasis on the gathering and storage of this data means that a sizeable proportion of it is likely to have been destroyed or lost. However, the Faculty of Social Science at the Open University has funded research into the location of vaccination registers and a full list of record offices with the areas for which vaccination registers are available is given in Drake and Razzell (1997).

The survival of the vaccination records is likely to have been affected by changes in administration. Initially, the whole system was set up and run under the auspices of the Boards of Guardians of the Poor Law Unions, which were abolished in 1930. Authority was then generally passed over to Local Authority Public Health Departments. The vaccination records along with other Poor Law records, by a process heavily reliant on luck and judgement may or may not have found their way to the local record offices. Those that did not, may

have been destroyed or, could still lie buried in the recesses of local authority basements. A prime example of this can be seen with the vaccination records for the city of Norwich. The Norwich Record Office now has a considerable collection of vaccination records dating from 1882 through to 1948. However, these registers were only unearthed in 1990 when a former Health Department building was converted to a Registry Office and the project architect found the records in the attic.

The local nature of the vaccination records, compiled without central supervision and control has allowed for significant variations in how and what, information was recorded. Despite the rigid legal framework governing the vaccination procedures, practices themselves may have differed between localities. For example, the timing of the vaccination, which legally was supposed to be within three months (four months for the Guardians). Some areas pursued the unvaccinated more vigorously then others at different points in time. Opposition to compulsory vaccination was subject to regional and class variations but the enforcement of the law was reliant on the strength of commitment of the regional justice systems. Again Williams (1994) give a full account of this. Information on the number of successful vaccinations at county level was collated centrally and published in the Annual Reports of the Poor Law Commissioners. It is this source that Williams (1994) uses, but apparently no researchers have investigated the individual registers.

Aside from the disadvantages caused by the survival and scattered nature of this source material there are the standard problems of deciphering handwriting (the later registers were typed) and potential for human error. To some extent the reliability of the source is dependent upon the diligence of the individual record keepers. As with civil registration data, boundary changes and the location of institutions such as workhouses and hospitals may cause some distortion of the death rate particularly when looking at changes over time. However,

because specific locations down to street name and house number as well as parish are generally given such changes are easier to identify.

The Medical Officer of Health Reports

The Public Health Act of 1872 established sanitary authorities in all areas whether rural or urban. These authorities in turn were required to appoint Medical Officers of Health who produced annual reports on the sanitary state and general health of the locality. These reports generally contain standard details of demographic data such as birth, death and disease rates plus reference to particular concerns of the individual MOH. These concerns may have related to national trends or local problems.

Figure Seven: Demographical Statistics Supplied by the MOH for Norwich 1896-1900

	1896	1897	1898	1899	1900
Population*	108,630	110,154	111,699	113,266	114,855
W.Wymer	53034	58,078	58,893	59,492	60,327
Density	14.4 (35.1)^	14.57 (35.5)^	14.8 (35.3)^	N/A	15.2(33.8)^
Birth Rate	31 (30.9)^	30.54 (30.7)^	29.9 (30.4)^	29.25	28.4(29.4)^
W.Wymer	28	29.5	27.5	26	26.4
IMR	165 (168)^	196 (176)^	194 (178)^	179 (182)^	178 (172)^
W.Wymer	N/A	186	186	200	174.6

(Source: The MOH Reports for West Wymer)

*Estimate (The enumerated population of Norwich in 1891 was 100,970 of which, East Wymer 47,936 and West Wymer 53,034)

^Average figure for the 33 great towns

The primary advantage of this source is that despite its official nature and factual quantitative content the reports also contain contemporary, expert, qualitative information. The qualitative element by nature introduces a question of interpretation of the individual opinions and bias of the writer. However, the unwitting testimony including the chosen emphasis and use of language (such as emotive appeals to the reader) are as valuable and fascinating as the facts. The reports were usually printed and several copies made.

However, again there is the problem of location and survival with the lack of a central collection point although generally the reports can be found in record offices and specialist libraries. Given that many MOHs were particularly concerned with the subject of infant mortality and concentrated much of their research on the subject, it is surprising that so few researchers have included this material in their studies. The major exception to this is Graham Mooney (1994).

As the forefathers of the Public Health officers of today the MOH were the experts of their time on the subject of infant mortality. Furthermore they were often experts on the locality as well. The first MOH for Norwich, Thomas Crosse had been a medical officer of the Norwich Union for more than 20 years before his appointment. In his first report, Crosse (1873) states that this previous position required him to 'visit constantly the dwellings of the lower classes, and to see the manner in which they live, or rather exist'. The opinions then of MOH such as Crosse are based on real knowledge. These opinions however, would have been influenced by the 'privilege of class' and as such adopt a 'superior' viewpoint rather than a purely objective one.

As **Figure Seven** illustrates, the annual reports provide contemporary background statistical information and breakdowns of death and disease for the city of Norwich and some useful material directly relevant to the topic of infant mortality. In the 1878 report a breakdown of parental occupations is given for the infants who died during that year.

Cemetery Records

In 1856 when the Norwich Cemetery opened the parish burial grounds were closed. Therefore with the exception of those who owned family plots in churchyards and those buried outside the district, all infants who died in the district were buried in the cemetery. It is easy to identify infant deaths from these records as age of the deceased is always given. Other information includes date of burial, name of deceased their parish of residence and in the case of children the father's name (or mothers if illegitimate). By cross-referencing the infant deaths in the burial register with those in the vaccination register I have been able to check for any discrepancies between the two sources in terms of the level of infant mortality. This check indicates any problems with institutions such as hospitals and workhouses causing distortion of the death rate in the district.

4. MAIN FINDINGS

4.1 THE NATURE OF INFANT MORTALITY IN WEST WYMER

In each of the eight years examined, the IMR for West Wymer was higher than the national rate. On average the West Wymer District was 18 deaths per thousand higher than the national level. The difference in rates was smallest in 1891 at only 4 per thousand but in 1899 reached as high as 34 per thousand. The numbers of births and deaths in each of the years together with the IMRs can be seen in **Figure Eight.**

Figure Eight: Infant Mortality Rates in West Wymer

YEAR	NATIONAL IMR	W.WYMER BIRTHS	W.WYMER DEATHS	W.WYMER IMR
1891*	149	1130	173	153
1893	159	1569	268	171
1894	137	1498	247	165
1895	161	1634	299	183
1896	148	1587	245	154
1897	156	1560	290	186
1899	163	1546	305	197
1909	109	1478	173	117
TOTALS (AVERAGE)	(148)	12002	2000	(167)

(Source: The Vaccination Registers for West Wymer)

*Note: The boundaries for West Wymer altered after 1891 when the five Norwich districts were merged in to two and five additional parishes were added.

4.1.1 Vaccination Practices

The Vaccination registers examined reveal that despite the fact that by law vaccination was compulsory, a significant number of infants in West Wymer successfully avoided it. Of the 1130 infants registered in 1891, 474 (42%) were vaccinated and 156 (14%) died before vaccination but the largest group of 500 (44%) were not vaccinated. The reasons for this are not immediately obvious and few clues are given in the registers themselves. The Insusceptibility certificate was not apparently used, as this column is generally blank. In a few instances the officer has pencilled in 'postponed' or 'P.' followed by a date and a doctor's name where presumably the vaccination was not given for medical reasons. Where the date of vaccination and the date of death columns are both blank, the Vaccination Officer has simply written a reference number in the final column.

Unfortunately the Vaccination Officer's Report books to which the reference numbers refer have not survived. Presumably these books would have revealed details of infants who had left the district after birth. However, occasionally the registers indicate that some infants born

in the district had been vaccinated elsewhere (in two instances in the 1891 Register the officer has written vaccinated in Warwick and York respectively).

The answer as to why such a high proportion of children managed to avoid vaccination is revealed in the two later registers. In 1898 a law was passed allowing parents to conscientiously object to vaccination. As a result an additional column can be seen in the 1899 and 1909 registers. These show that 39% of infants in 1899 and 57% in 1909 were not vaccinated because of parental objection. Given these levels and the unexplained gaps in the earlier registers it is apparent that parents were successfully objecting to vaccination before they were legally entitled to do so.

Timing of Vaccinations

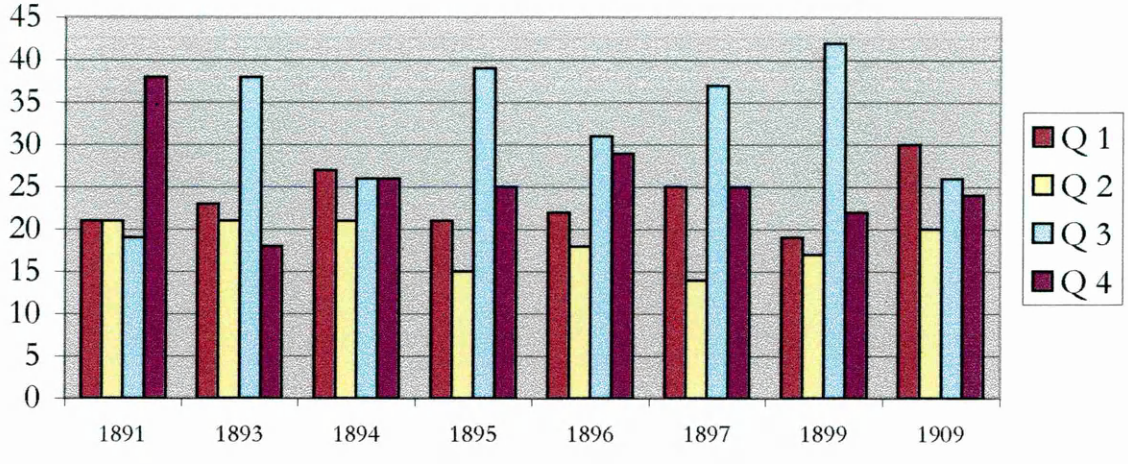
Of those infants that were vaccinated most received their inoculation within a year of birth generally between the ages of two and six months with the third month being marginally the most popular. However, for a significant minority of vaccinations the gap between birth and the inoculation was considerably wider. The age of 11 was the most common 'late vaccination' timing although for a small number this was later still at the age of 37. Whilst it is not surprising that older children and adults were vaccinated against smallpox it is noteworthy that the Vaccination Officer was still interested in and able to gather this information so long after the infants had passed the one year period of his jurisdiction. A full breakdown of the gaps between birth and vaccination dates can be found in **Appendix 3.**

4.1.2 Seasonal Mortality

The results of analysing the infant mortality in West Wymer on a monthly and seasonal basis can be seen in **Figure Nine.** Third quarter (summer) peaks are apparent in four of the eight years with 1899 being the most dramatic year. The four years with third quarter peaks are also the four years with the highest IMRs with the most dramatic years for both statistics being 1899. A very similar pattern of peaks is apparent both on the Norwich (**Figure 4**) and the

England (**Figure 2**) quarterly breakdowns. However, the fact that 1899 was the year with the greatest differential between the national and local IMRs (34 per thousand) gives weight to the theory that third quarter peaks in the larger cities served to inflate mortality rates and keep them higher than they otherwise would have been.

Figure Nine: West Wymer, Infant Deaths per Quarter as a percentage of Infant Deaths per Year 1891-1909



(Source: The Vaccination Registers for West Wymer)

4.1.3 Location Variables

In 1891 the West Wymer district consisted of nine parishes, between 1892 and 1893 a further five parishes were added when the five Norwich districts were merged in to two. Of the parishes Heigham was by far the largest and included the city workhouse. The city children's hospital was also located within the district in the Parish of St. Margaret and after the merging of districts West Wymer also included the main city hospital in the parish of St Stephen. According to the 1891 Vaccination Register the public institutions did not have any significant effect on infant mortality as only 2% of infants were born there and an even lower percentage died there. Also according to the 1891 register, the children's hospital apparently rarely treated infants less than one year old as only two infants died there (both were born outside the district and were not buried there).

As **Figure Ten** shows there was no substantial variation between the birth and death rates in any of the parishes.

Figure Ten: Parish Breakdown of Births and Deaths During 1891

PARISH	BIRTHS		DEATHS	
	No.	%	No.	%
Earlham	4	-	1	-
Heigham	943	83	142	82
St Andrew	10	1	1	1
St Benedict	78	7	15	9
St Gregory	14	1	2	-
St John Maddermarket	5	-	0	-
St Lawrence	12	1	1	-
St Margaret	20	2	4	2
St Swithin	22	2	4	2
Workhouse	22	2	3	1
TOTAL	1130		173	

(Source: The Vaccination Registers for West Wymer)

4.1.4 Age At Death

An analysis of the age at death of children whose deaths were registered during 1891 shows that 33% of infants died within the first month of life and that 59% died within the first three months of life. A more detailed analysis of age at death together with the actual figures for 1891 is given in section **4.2.2**

4.1.5 Class Structure

The occupations of the parents given in the Vaccination Registers suggest this was a district of plentiful employment in a wide variety of trades, services and industry. Applying Armstrong's social classification system (reprinted in Drake and Finnegan, 1994), to the occupations of all fathers whose infants births were registered in 1891 and comparing it to the occupations of those whose children died in 1891/2 shows that the vast majority belonged to social class III.

As **Figure Eleven** shows, an even greater percentage of the deaths group belonged to this class. This is due not only to less children from the higher social groups dying but because less children from the lowest social groups IV and V died compared to those from class III. It is important to remember that West Wymer was largely an artisan suburb and it is not

surprising therefore that most of its working men belonged to class III (which largely consists of skilled trades). The fact that the children of this class were more likely to die than those from lower classes is more surprising although the differences in the numbers involved are probably too small to be statistically significant. In his 1878 report the MOH exclaimed 'why is the mortality almost entirely confined to the children of the artisans of the city?' a question he could not answer but hoped The Artisans Dwelling Act would.

Figure Eleven: Social Hierarchy of Occupations

CLASS	ALL FATHERS		DEATHS ONLY	
Class I	13	(2%)	0	
Class II	21	(2%)	1	(1 %)
Class III	842	(81%)	161	(90%)
Class IV	134	(13%)	17	(9 %)
Class V	24	(2%)	0	
TOTAL	1034		179	

(Source: The Vaccination Registers for West Wymer)

4.1.6 Occupational Structure

An examination of specific trades and services shows that there are no major differences between the fathers whose children died and those that survived. In fact the largest employment sector (manufacturing) shows an identical percentage in the births and deaths groups. The second and third largest employment areas, the building and shoe trades, do show slight variations between the births and deaths groups but this is largely at each others expense. There is a three per cent increase between deaths and births of the children whose fathers worked in the building trades and a four per cent decrease in the shoe trade group. A summary of the results of this examination can be seen in **Figure Twelve.** A breakdown of individual trades and services is given in **Appendix 4.** The Vaccination Registers do not show the occupations of mothers except for those that were unmarried. An examination of these female occupations can be seen in **4.2.4.**

Figure Twelve: Occupations Summary

TRADE/SERVICE	ALL FATHERS		DEATHS ONLY	
	NO.	%	NO.	%
1. Building	176	17	36	20
2. Shoes	169	16	21	12
3. Clothes	47	5	15	8
4. Farming	32	3	8	4
5. Food	111	11	23	13
6. General Services	34	3	2	1
7. Manufacturing	178	17	31	17
8. Professional	84	8	9	5
9. Communications	52	5	8	4
10.Merchandising	85	8	13	7
11.Transport	66	6	13	7
TOTALS	1034		179	

(Source: The Vaccination Registers for West Wymer)

4.1.7 Other Factors

Gender Distribution

An analysis of the sex of infant births registered in 1891 shows that 52% were male and 48% were female. This differentiation increased further amongst the infant deaths registered during the year with 59% being male.

Twins

There were five sets of twins born in the district during 1891. Of these only one set survived long enough to be vaccinated. In one case both twins died and in the remaining three cases only one twin survived. This suggests that twins had a greater propensity to mortality but that the occurrence was so low not as to have a major effect on the overall statistics.

Deaths after Vaccination

Twelve per cent (a total of 26) of the children who died during 1891 or who were known to have died in 1892 had been vaccinated. Vaccination dates are available for 15 of these, the gap between vaccination and death varies from 13 days to 8 months and there seems to be no evidence that any infants died as a result of receiving the vaccine.

4.2 THE NATURE OF ILLEGITIMATE MORTALITY

4.2.1 Illegitimate Mortality Rates

The figures quoted by the MOH indicate that in 1878, 51% of illegitimate children died. Unfortunately he gives no explanation for this phenomenon. In 1891 the proportion of illegitimate infants dying in West Wymer was still excessive at 37%. However this was not the highest level of the years examined as in 1894 the level reached 40%.

Figure Thirteen shows a summary of the illegitimate IMR statistics, the monthly and yearly breakdown of figures on which this is based can be seen in **Appendix 5. Figure Thirteen** shows that the illegitimate birth rate remained fairly constant with the lowest level being in 1897 at 5% of all births and the highest point being 1891 when 6.5% of births were illegitimate. The proportion of illegitimate deaths was less consistent; again the high point was 1891 with 15.6% of all deaths being illegitimate and the low point 1895 at 7%. The high point in terms of the IMR was different reaching 395 per thousand in 1894.

Figure Thirteen: The Illegitimate Mortality Rate in West Wymer

(Note: These are period rates not cohort rates)

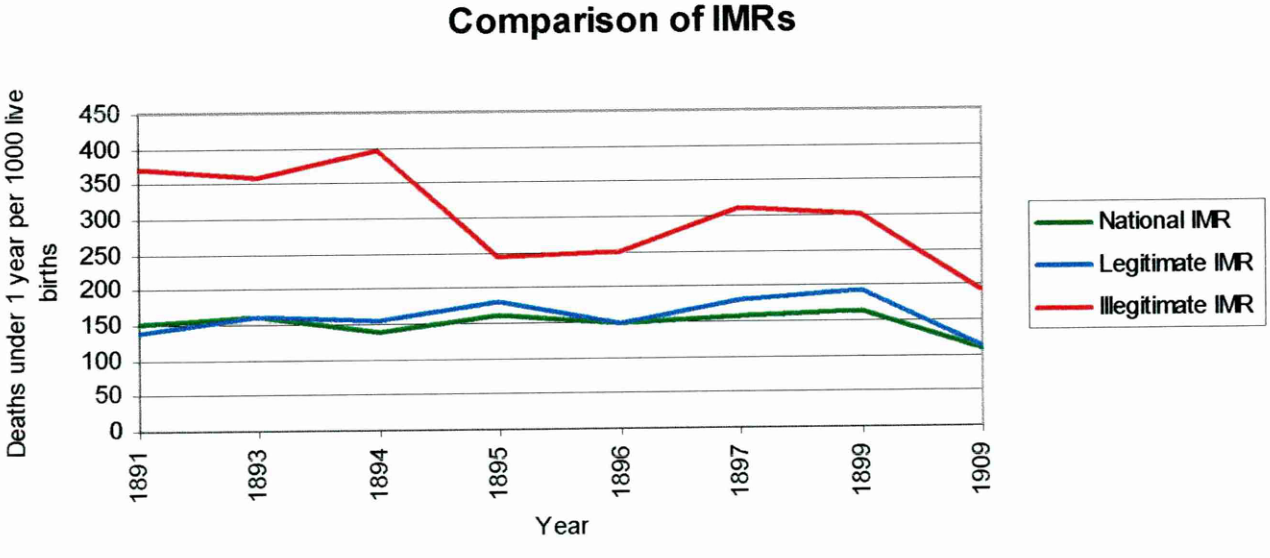
YEAR	ILL. BIRTHS	% of all births	ILL. DEATHS	% of all deaths	ILL. IMR
1891	73	6.5	27	15.6	370
1893	84	5.4	30	11.2	357
1894	81	5.4	32	13.0	395
1895	86	5.3	21	7.0	244
1896	92	5.8	23	9.4	250
1897	78	5.0	24	8.3	308
1899	97	6.3	29	9.5	299
1909	84	5.7	16	9.2	190
TOTALS (Average)	675	(5.6)	202	(10.1)	299

(Source: The Vaccination Registers for West Wymer)

On average the illegitimate IMR in each of the eight years examined was 151 per thousand higher than the national IMR and 132 per thousand higher than the overall IMR for West Wymer. In 1894 the illegitimate IMR was a staggering 258 per thousand higher than the national IMR (230 per thousand higher than the West Wymer IMR).

However the overall pattern of fluctuations of the different mortality rates seems to be consistent from 1896 onwards. 1894 appears to be a significant year, this year shows the most dramatic difference between legitimate and illegitimate mortality after which the difference decreased and the two ran in parallel. This pattern is clearly illustrated in **Figure Fourteen**. When the illegitimate infants are deducted from the overall West Wymer statistics to uncover the legitimate IMR it brings the rate down virtually in line with the National IMR (although of course this would itself have included illegitimate births). In fact in 1891 the legitimate mortality rate dropped below the national level and in 1896 equalled it exactly.

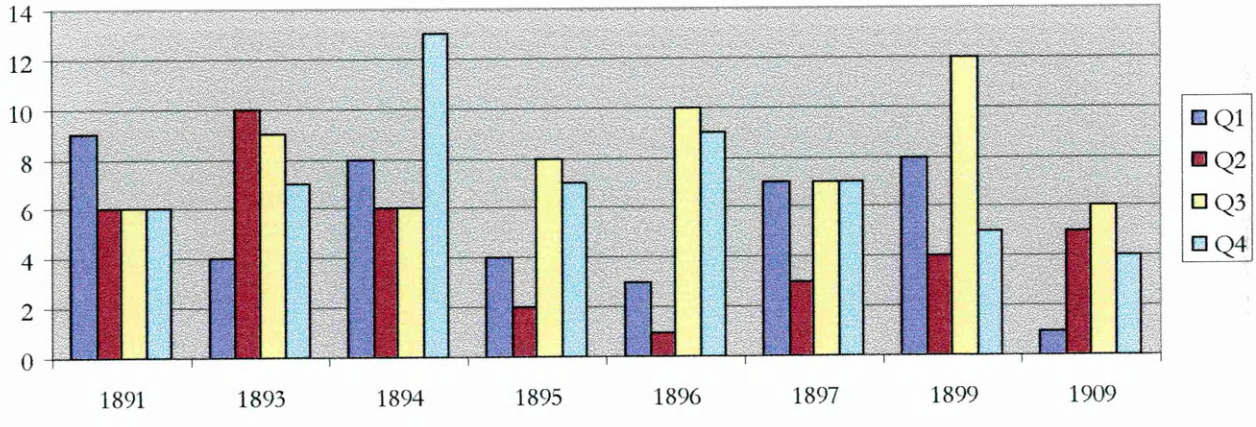
Figure Fourteen: The Illegitimate and Legitimate Mortality Rates Compared



(Source: The Vaccination Registers for West Wymer and the Annual Reports of the Registrar General)

It is noteworthy that the illegitimate mortality rate is not apparently affected by the third quarter summer peaks in the same way as legitimate mortality and this is clearly shown in **Figure Fifteen**. As has already been illustrated in **4.1.2** the four years with the largest third quarter peaks (1899, 1897, 1895 and 1893) were also the years with the highest overall infant mortality rates and this remains the case when the illegitimate births are deducted from the figures. However, the peak mortality years for illegitimate infants were 1894 and 1891 where the majority of deaths were in the winter months. This could indicate that illegitimate babies were less prone to death from diarrhoea. One possible explanation for this could be differences in age at death of legitimate and illegitimate infants (see **4.2.2** below).

Figure Fifteen: West Wymer, Illegitimate Infant Deaths per Quarter as a percentage of Infant Deaths per Year 1891-1909



(Source: The Vaccination Registers for West Wymer)

4.2.2 Age at death

An analysis of the ages of infants at death during 1891 shows that illegitimate babies appeared to die at an earlier age than legitimates. Although the proportion dying in the first month is similar the gap widens at three and six months. No illegitimate infants were over nine months of age at death. These results can be seen in **Figure Sixteen**.

Figure Sixteen: Age at Death of Infants under One Year, 1891

AGE AT DEATH	LEGITIMATE		ILLEGITIMATE	
One day or less	8		3	
Two to seven days	16		2	
Eight to thirty days	23		4	
SUBTOTAL	**47**	(32%)	**9**	(33%)
One month	17		3	
Two months	12		2	
Three months	8		3	
SUBTOTAL	**37**	(26%) [58%]	**8**	(30%) [63%]
Four months	12		2	
Five months	7		1	
Six months	4		2	
SUBTOTAL	**23**	(16%) [74%]	**5**	(19%) [82%]
Seven months	11		3	
Eight months	8		0	
Nine months	7		2	
SUBTOTAL	**26**	(18%) [92%]	**5**	(19%) [100%]
Ten months	4		0	
Eleven months	8		0	
SUBTOTAL	**12**	(8%) [100%]	0	
TOTAL	**145**		**27**	

(Source: The Vaccination Registers for West Wymer)

4.2.3 Location Variables

An analysis of the parish of birth and death of infants during 1891 shows that the major difference between legitimate and illegitimate infants was the workhouse. A full breakdown of the location of illegitimate births and deaths is given in **Appendix 6** and a summary is given below in **Figure Seventeen.** The major point of note is that although one quarter of illegitimate infants were born in the workhouse less than half this amount died there.

Figure Seventeen: Parish Breakdown of Births and Deaths During 1891

	BIRTHS		DEATHS	
PARISH	**Legitimate**	**Illegitimate**	**Legitimate**	**Illegitimate**
Earlham	3	1	0	1
Heigham	905 (86%)	38 (52%)	126 (86%)	16 (59%)
St Andrew	10	0	1	0
St Benedict	71 (7%)	7 (10%)	11 (8%)	4 (15%)
St Gregory	12	2	1	1
St John M.	4	1	0	0
St Lawrence	11	1	0	1
St Margaret	15	5 (7%)	2	2
St Swithin	4	0	4	0
Workhouse	4	18 (25%)	1	2 (7%)
TOTAL	**1057**	**73**	**146**	**27**

(Source: The Vaccination Registers for West Wymer)

The results of an examination of the proportion of illegitimate infants who were born or who died in the workhouse in each of the eight years investigated can be seen in **Figure Eighteen.** This shows that on average 22 % of illegitimate children were born in the workhouse. The average proportion of deaths in the workhouse was 9%. This could be an indication that the workhouse was by no means an unhealthy place to be born and possibly increased an illegitimate baby's chance of survival. Alternatively a significant proportion of children born in the workhouse may have moved away before death.

Figure Eighteen: Proportion of Illegitimate Births and Deaths in the Workhouse

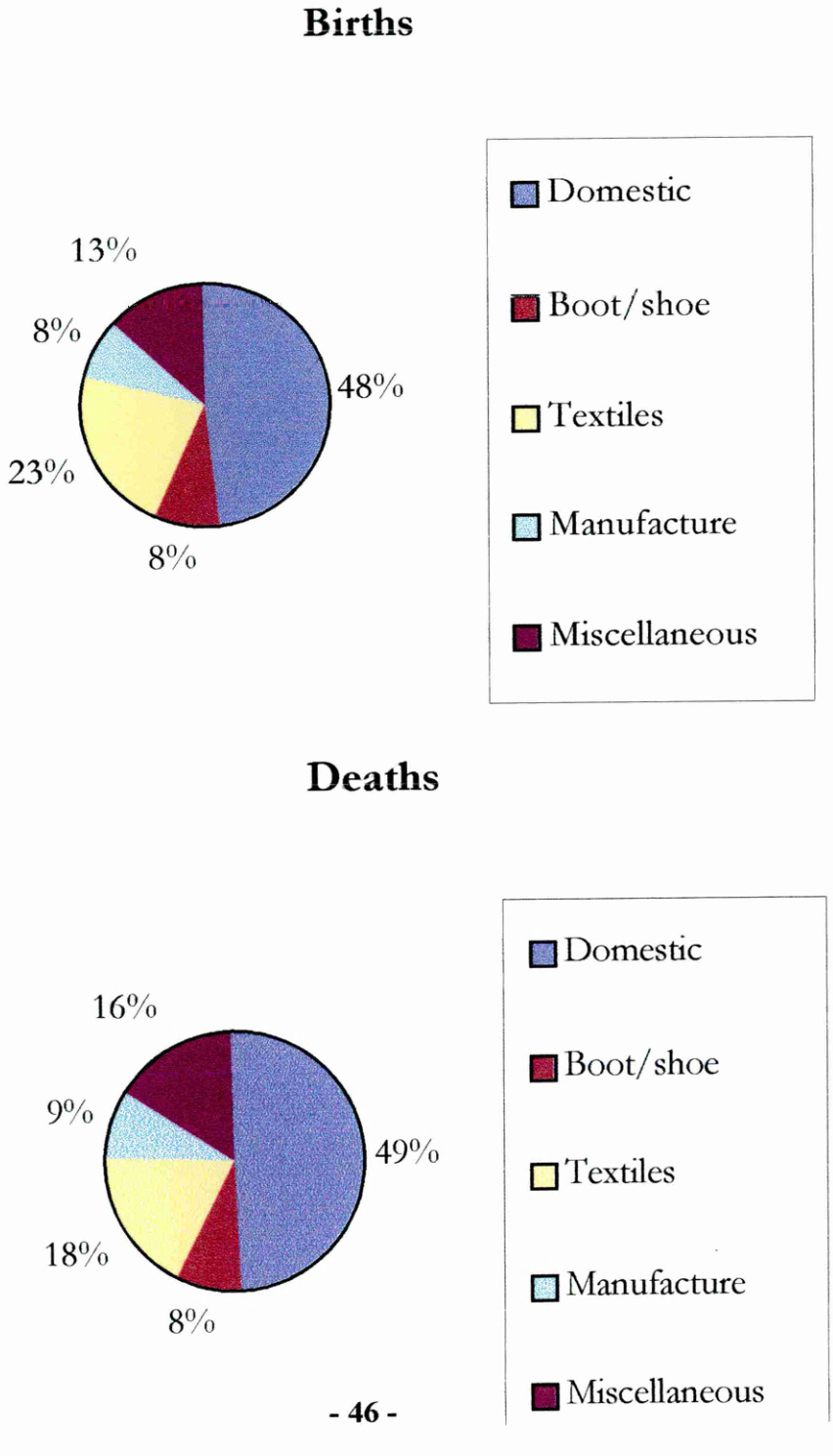
Year	Births	Deaths
1891	25%	7%
1893	23%	10%
1894	21%	13%
1895	24%	4%
1896	22%	4%
1897	18%	4%
1899	20%	14%
1909	23%	19%

(Source: The Vaccination Registers for West Wymer)

4.2.4 Occupational Structure

The Vaccination Registers show that there were a variety of employment opportunities for women (at least for those who were unmarried). **Figure Nineteen** shows a summary of the proportion of women employed in each of the main sectors. A full breakdown of occupations is given in **Appendix 7**. Comparing the occupations of women whose babies died below one year of age to those of all illegitimate mothers shows there are no major differences.

Figure Nineteen: Occupations of Unmarried Mothers, Births and Deaths Compared
(Source: The Vaccination Registers for West Wymer)



5. CONCLUSIONS

The Vaccination Registers for West Wymer illuminate various aspects of the nature of infant mortality. The data suggests that illegitimate infants did not suffer from the phenomenon of summer deaths to the same extent as legitimate babies. This could well be connected to the finding that illegitimate babies apparently died younger than legitimate infants. Diarrhoeal diseases were more likely to affect older babies and younger babies generally died from pre or neo natal related causes. Therefore the West Wymer clearly displays the crude relationship between age at death and cause of death.

The fact that so few illegitimate babies died in the workhouse and such a large majority of illegitimate infants were not born there could indicate that women were not forced to rely on charity because of the plentiful employment in the area. Single mothers appear to have generally used the workhouse as a maternity or 'laying in' hospital and did not want or need to stay there for long after the birth. The low level of deaths amongst illegitimate babies in the workhouse could also indicate that this was a relatively safe place for an infant to be. It is possible that living conditions inside the workhouse including levels of nutrition, medical assistance and general safety were of a higher standard then those facing illegitimate babies and their mothers on the outside.

The findings indicate that mortality differences between legitimate and illegitimate infants are significant. The difference in statistical patterns is both intriguing and puzzling, as is the effect that illegitimate deaths have on the overall mortality rate. The inflationary effect of third quarter peaks on overall mortality figures has been well researched and documented but the inflationary effects of deaths amongst illegitimates could also be significant. The high illegitimate IMR could be another factor serving to keep the overall IMR unnecessarily high in

the larger towns and cities. Although of course research confined to one urban area cannot ascertain whether the effect of the illegitimate IMR was common in rural areas also.

The differences between illegitimate infants who died and those that survived are not apparent in this data. It might have been expected that for example, domestic servant's children would be more likely to die than those employed in trades that could be undertaken in the mother's own home, the presumption being that it would possibly be easier for these mothers to care for their babies. However this data shows that there were no real differences in the type of employment between the mothers of the illegitimate babies that died and those that did not. Location of housing does not appear to be a significant factor either. In this data there is no evidence of 'unhealthy streets' or of illegitimates being confined to certain areas. In this thesis I have declined to enter the public health debate. Sewerage, sanitation and the water supply were uniformly bad within the city. It is clear from my analysis of social class that the wealthy did not choose to live in this area but the major predominance of social class III inhabitants proves that this was not a poor area either.

Therefore my proposed solution to the infant mortality conundrum must lie in the nurture, nutrition and domestic hygiene camp. How were illegitimate babies cared for? The importance of family support is one obvious feature that needs to be researched in sources outside those used in this particular thesis (the census could well be helpful). The specific relationship between illegitimate mortality and overall decline is yet another conundrum. Should the post-1900 improvement in domestic hygiene and nutrition argument, prove to be the most satisfactory solution then, it seems obvious that those at the lowest end of the social spectrum (which must include illegitimates) were those most likely to benefit from such measures. This conclusion is weakened by the fact that it has been reached by elimination and not evidence. However, I believe my research has suggested a link between illegitimate death and the infant mortality decline and that this is a relationship that merits further investigation.

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7. POSTSCRIPT

A useful addition to these findings would be a comparison to comparable data from another location in order to establish what is unique and what is common about the infant mortality patterns established in this research. An analysis of illegitimate mortality rates in both other urban areas and rural localities would be particularly useful. Furthermore it would be useful to expand the research time wise both earlier in to the 1870s (if the data is available) and forwards through the first few decades of the twentieth century.

As I have already indicated in my conclusion comparison between the vaccination register and census data could prove to be illuminating. Not only from the point of view of family networks (if single mothers were sharing accommodation with relations) but also from other aspects such as overcrowding (as the census shows the number of rooms occupied and lists all the inhabitants). If adequate parish records or other suitable data were available than a nominal record linkage exercise reconstituting the life course of as many illegitimate mothers in a particular area as possible could prove the relevance of illegitimacy theories such as Laslett's bastardy prone sub-society. By illuminated such an exercise with the infant death data from vaccination registers it could well be possible to prove more precisely the nature of the link between infant mortality and illegitimate death.

8. APPENDICES

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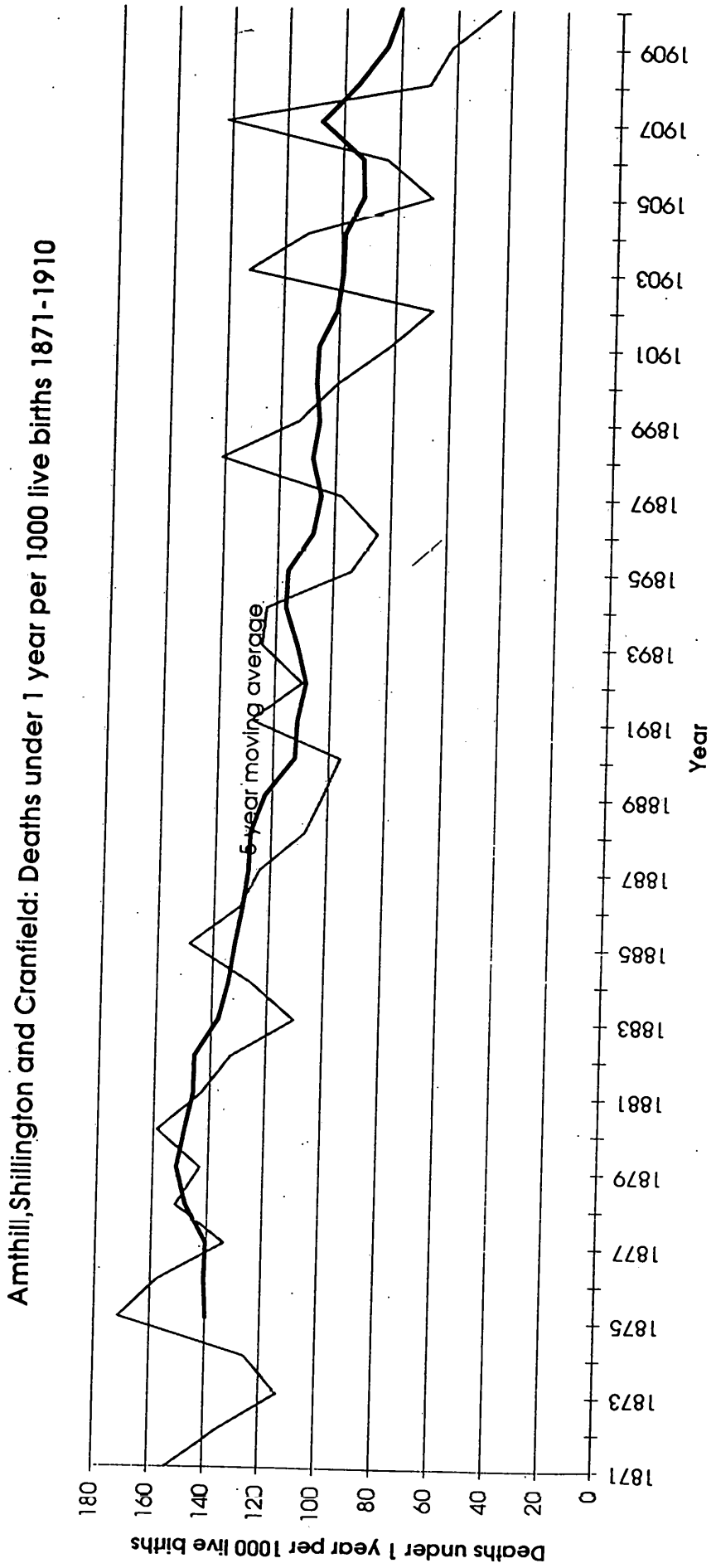
Amthill,Shillington and Cranfield: Deaths under 1 year per 1000 live births 1871-1910
Deaths under 1 year per 1000 live births
180
160
140
120
100
80
60
40
20
0
5 year moving average
Year
1871
1873
1875
1877
1879
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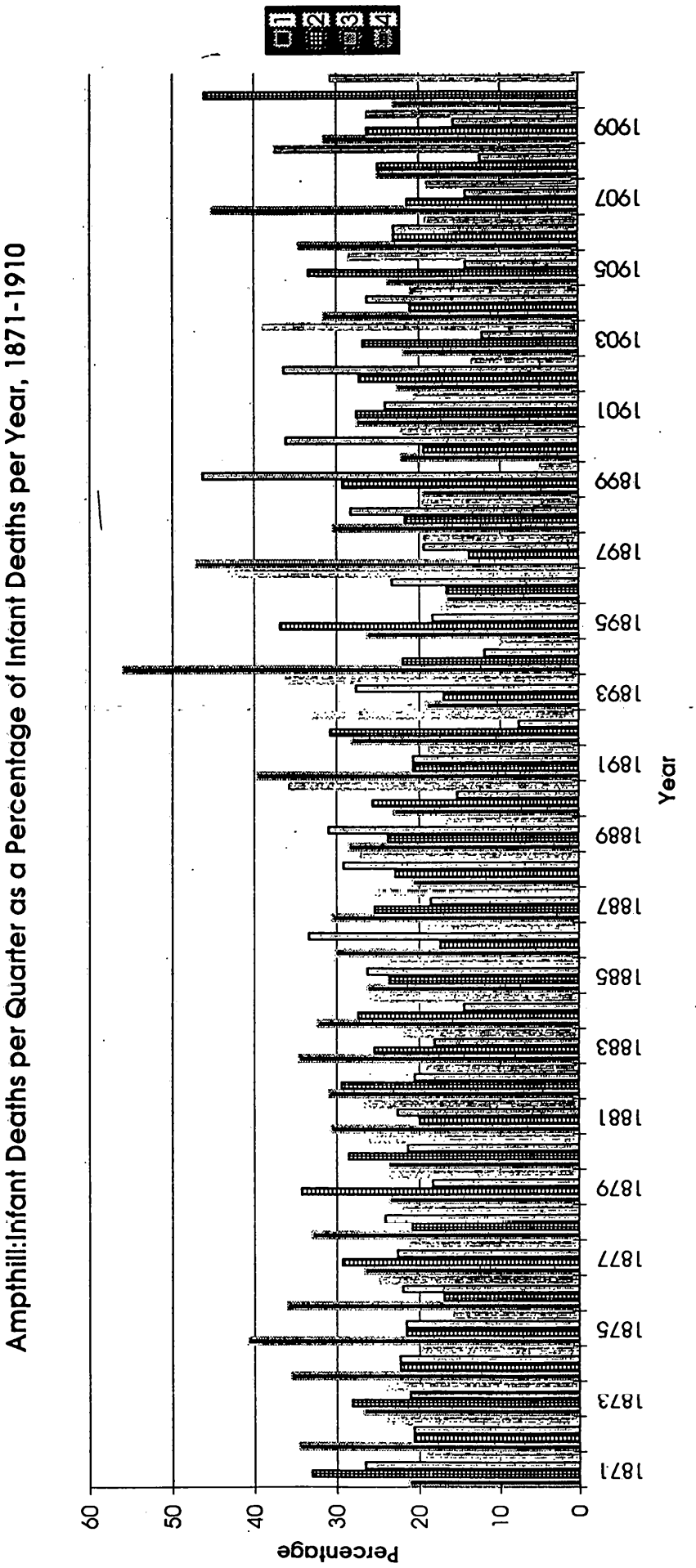
Ampthill:Infant Deaths per Quarter as a Percentage of Infant Deaths per Year, 1871-1910
1 2 3 4
Percentage
60
50
40
30
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10
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Year
1871
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1905
1907
1909

Appendix 3

A Breakdown of the Gap between Birth and Vaccination, West Wymer 1891

Gap in months	Gap in days	No.	%
1	1 -30	15	3
2	31 -60	76	16
3	61 –90	92	19
4	91 –120	71	15
5	121-150	63	13
6	151-180	58	12
7	181-210	39	8
8	211-240	11	2
9	241-270	3	1
10	271-300	2	1
11	301-330	2	1
12	331-360	0	-
OVER 12	361-13262	42	9
TOTAL		474	

Gap in Years	No.	%
Less than 1	432	92
1-2	2	-
3-4	2	-
5-6	2	-
7-8	4	1
9-10	4	1
11-12	14	3
13-14	2	-
15-16	1	-
17-18	-	-
19-20	4	1
21-22	3	1
23-24	1	-
37-38	3	1
TOTAL	474	

Appendix 4

A Breakdown of Trades and Services, West Wymer 1891.

1. Building Trades	All FATHERS	DEATHS ONLY
Bricklayers	66	13
Builders	6	-
Carpenters	46	7
Electricians	1	1
General labourers	3	-
Glazier	1	-
Joiners	4	1
Painters	31	7
Plasterers	3	1
Plumbers	15	6
	176	**36**
2. Leather Work		
Boot makers	12	-
Clickers	14	3
Lasters and heelers	10	2
Leather workers	12	2
Shoe manufacture	117	13
Tanners	4	1
	169	**21**
3. Clothes Production/Sales		
Clothiers	4	3
Drapers	12	4
Hatter/currier	1	1
Tailors	30	7
	47	**15**
4. Farm/Land/Animal Work		
Cow keeper	1	-
Dairyman	1	-
Farm workers	7	1
Gardeners	13	4
Ground Caster	1	1
Horse workers	5	2
Naturalist	1	-
Nursery workers	3	-
	32	**8**

5. Food and Drink Production/Sales	All Fathers	Deaths Only
Bakers	15	2
Baking powder	1	-
Butchers	14	5
Brewers /distillers/maltsters	16	5
Confectioners	5	2
Fish Merchants	5	1
Game Merchants	2	-
Grocers/greengrocers	28	6
Licensed victuallers/bar staff	4	-
Milk Sellers	4	1
Millers	3	-
Mineral water manufacture	6	-
Mustard making	1	-
Tea dealer	2	1
Wine merchants	4	-
Yeast maker	1	-
	111	23
6. General/ Household Services		
Bookmaker	1	-
Butlers	4	-
Carpet Planner	1	-
Chimney sweep	2	-
Hairdressers	3	-
Hotel workers	3	-
Laundry workers	2	-
Musician	1	-
Photographers	1	-
Piano tuners	1	-
Porter	1	-
Sign writer	1	-
Utility workers (gas and water)	12	2
Waiter	1	-
	34	2

7. Manufacturing (miscellaneous)	All Fathers	Deaths Only
Blacksmiths	13	5
Box makers	1	1
Brick making	1	-
Brush making	15	2
Cabinet Makers	7	-
Coopers	1	-
Cord and rope	2	-
Crepe	1	-
Cutlers	1	-
Dyers	1	-
Engines	13	3
Engravers	2	-
French polishers	2	-
Harness	6	1
Lime	2	-
Matchmakers	1	-
Metal	26	6
Organ building	3	-
Perfume	1	-
Sewing Machines	19	2
Starch	3	2
Stone work	12	1
Textiles	2	-
Umbrellas	1	-
Upholstery	8	2
Watches	2	-
Waterproofing	1	-
Wickerwork	9	-
Wire	11	2
Wood/timber products	11	4
	178	31

8. Professional/Official Services	All Fathers	Deaths Only
Accountants	6	-
Auctioneer	1	-
Architect	2	-
Bankers	1	-
Caretaker of plate	1	-
Chemist	4	-
Clergy	4	-
Engineer	2	1
Inland Revenue	3	-
Inspector weights and measures	1	-
Insurance	24	1
Land Agents	2	-
Librarian	1	1
Local authority	7	1
Military	3	-
Police officers	10	4
Solicitors	6	-
Surgeon	1	-
Teachers	5	1
	84	**9**
9. Publishing/Printing/Communications		
Advertising	1	-
Book binders	3	-
Compositors	13	2
Journalists	1	1
Newspaper staff	1	-
Postal workers	17	2
Printers	9	1
Publishers	2	1
Telephone/telegraph	5	1
	52	**8**

10. Sales and Merchandising (Miscellaneous)	All Fathers	Deaths Only
Book/Bible Sellers	2	1
China Dealers	2	1
Coal Merchants	17	3
Commercial Travellers	16	2
Commission Agents	2	-
Corn Merchants	1	-
Florists	1	-
Furniture	3	1
Hardware	1	-
Iron Mongers	9	1
Japanned goods	1	-
Jewellery	2	2
Leather sales	1	-
Merchants/dealers (general)	3	-
Music seller	2	1
Oil and lamp dealer	1	-
Seed merchants	8	1
Stationers	2	-
Timber merchants	8	-
Tobacco	3	-
	85	13
11. Transport Workers		
Carters /carriers	5	-
Coach/Carriage Making	17	4
Coach/ Cab Drivers	13	2
Draymen	1	-
Engine Drivers	4	-
Mariners/sailors	1	2
Omnibus driver	1	-
Railway workers	24	5
	66	13

Appendix 5

Statistics Taken From The Vaccination Registers For West Wymer

KEY

DPV= Deaths Pre Vaccination

DPM= Deaths Per Month

IB= Illegitimate Births

IDPM= Illegitimate Deaths Per Month

IDPV= Illegitimate Deaths Pre Vaccination

1893	Births	DPV	DPM	IB	IDPM	IDPV
January	130	25	19	6	0	3
February	145	16	22	9	3	3
March	136	24	21	7	1	1
April	142	25	25	7	5	3
May	129	24	13	11	1	2
June	145	22	18	6	4	3
July	100	17	31	7	1	3
August	149	20	48	6	5	2
September	125	12	23	6	3	2
October	131	16	9	6	2	0
November	138	24	22	5	2	1
December	99	14	17	8	3	5
TOTALS	1569	239	268	84	30	28

1894	Births	DPV	DPM	IB	IDPM	IDPV
January	124	17	38	6	2	2
February	127	12	19	6	5	2
March	140	21	10	10	1	4
April	126	22	20	6	2	1
May	125	18	17	2	1	0
June	121	22	14	7	3	3
July	107	17	20	7	1	2
August	124	14	28	3	3	0
September	113	22	16	7	2	4
October	141	19	13	8	3	3
November	134	31	25	8	3	3
December	116	23	27	11	7	8
TOTALS	1498	238	247	81	33	32

1895	Births	DPV	DPM	IB	IDPM	IDPV
January	136	24	25	9	2	2
February	156	24	14	10	0	3
March	145	28	23	8	2	2
April	134	18	21	7	1	1
May	147	32	16	11	1	3
June	107	24	8	9	0	3
July	148	29	38	2	2	2
August	147	26	48	3	5	0
September	135	29	32	10	1	3
October	134	16	31	9	3	3
November	121	14	19	1	2	0
December	124	16	24	7	2	2
TOTALS	1634	280	299	86	21	24

1896	Births	DPV	DPM	IB	IDPM	IDPV
January	115	14	20	8	1	1
February	128	26	16	12	1	1
March	126	16	19	6	1	2
April	130	21	15	9	1	3
May	137	24	14	7	0	3
June	128	13	14	5	0	1
July	127	21	26	8	2	3
August	127	24	36	7	4	2
September	136	21	15	6	4	1
October	145	21	17	6	2	2
November	144	21	20	9	4	2
December	144	28	33	9	3	4
TOTALS	1587	250	245	92	23	25

1897	Births	DPV	DPM	IB	IDPM	IDPV
January	137	24	28	11	2	1
February	125	18	19	8	1	2
March	163	31	25	9	4	5
April	118	17	11	9	0	3
May	126	21	15	5	3	3
June	137	41	14	5	0	1
July	137	28	25	5	2	3
August	120	18	43	4	2	1
September	120	26	38	6	3	2
October	115	13	18	4	2	2
November	118	21	18	3	3	1
December	144	29	36	9	2	2
TOTALS	1560	287	290	78	24	26

1899	Births	DPV	DPM	IB	IDPM	IDPV
January	128	15	19	13	1	4
February	133	9	16	4	5	1
March	144	18	22	9	2	4
April	131	18	19	11	1	3
May	131	25	18	12	2	3
June	107	21	15	5	1	1
July	138	27	29	7	3	3
August	141	32	55	10	6	4
September	135	34	45	6	3	3
October	108	14	20	8	2	2
November	129	20	22	6	2	0
December	121	21	25	6	1	0
TOTALS	**1546**	**254**	**305**	**97**	**29**	**28**

1909	Births	DPV	DPM	IB	IDPM	IDPV
January	111	12	14	4	1	1
February	106	14	14	8	0	1
March	132	16	24	9	0	0
April	142	14	12	9	1	0
May	136	6	13	3	2	0
June	160	12	9	8	2	2
July	90	12	13	8	1	3
August	128	15	13	5	0	0
September	117	10	19	8	5	1
October	128	10	11	6	2	3
November	109	6	12	7	2	0
December	119	15	19	9	0	1
TOTALS	1478	142	173	84	16	12

Appendix 6

LOCATION OF ILLEGITIMATE BIRTHS

PARISH	1891	1893	1894	1895	1896	1897	1899	1909	TOTALS
Earlham	1	0	0	0	0	0	0	0	1
Eaton	n/a	1	0	2	1	0	0	0	4
Heigham	38	34	32	29	44	32	46	31	287 (43%)
Lakenham	n/a	10	11	15	7	8	12	11	74 (11%)
St Andrew	0	1	0	1	0	0	0	0	2
St Benedict	7	2	2	1	4	2	1	2	21 (3%)
St Giles	n/a	3	4	4	3	5	4	3	26 (4%)
St Gregory	2	2	1	0	1	0	1	1	8
St John M.	1	0	0	2	0	1	1	0	5
St Lawrence	1	2	1	2	2	2	3	0	13
St Margaret	5	1	3	1	3	2	1	0	16
St Peter M.	n/a	0	2	2	1	2	1	1	9
St Stephen	n/a	8	7	3*	4	9	5	2*	38 (6%)
St Swithin	0	1	3	0	2	1	2	0	9
Workhouse	18	19	17	21	20	14	19	19**	147 (22%)
No Parish	0	0	0	0	0	0	1	14	15
TOTAL	**73**	**84**	**81**	**86**	**92**	**78**	**97**	**84**	**675**

*Includes 1 birth in hospital

**By 1909 the workhouse had become 'The Lodge'

LOCATION OF ILLEGITIMATE DEATHS

PARISH	1891	1893	1894	1895	1896	1897	1899	1909	TOTALS	
Earlham	1	0	0	0	0	0	0	0	1	
Eaton	n/a	0	0	0	0	0	0	0	0	
Heigham	16	15	9	6	13	10	15	10	94	(47%)
Lakenham	n/a	5	6	4	3	1	3	1	23	(11%)
St Andrew	0	0	0	0	0	0	0	0	0	
St Benedict	4	2	0	0	1	1	1	0	9	(4%)
St Giles	n/a	0	0	1	1	2	0	0	4	(2%)
St Gregory	1	1	0	0	1	0	0	0	3	(1%)
St John M.	0	0	0	0	0	0	0	0	0	
St Lawrence	1	0	2	1	0	0	1	0	5	(2%)
St Margaret	2	1	2	1	3	2	0	1	12	(6%)
St Peter M.	n/a	0	3	1	0	3	1	0	8	(4%)
St Stephen	n/a	3*	3	2	0	4	4*	0	16	(8%)
St Swithin	0	0	3	0	0	0	0	1	4	(2%)
Workhouse	2	3	4	5	1	1	4	3**	23	(11%)
TOTAL	**27**	**30**	**32**	**21**	**23**	**24**	**29**	**16**	**202**	

*Includes 1 death in hospital

**By 1909 the workhouse had become 'The Lodge'

Female Occupations of Unmarried Mothers in West Wymer

BIRTHS	1891	1893	1894	1895	1896	1897	1899	1909	TOTAL
Asylum Attendant	0	1	0	0	0	0	1	0	2
Barmaid	1	0	0	2	2	0	1	3	9
Boot/Shoe Fitter	1	3	1	2	0	2	2	1	12
Boot/Shoe Maker	5	6	9	7	3	4	4	4	42
Bottler	0	0	0	0	0	2	1	0	3
Box Maker	2	0	0	3	1	0	0	0	6
Brewery Hand	0	0	0	0	0	0	1	0	1
Brush Maker	0	2	0	1	0	3	2	0	8
Chambermaid	0	0	0	0	0	0	0	1	1
Charwoman	6	6	8	2	5	4	8	6	45
Chocolate Maker	0	1	0	1	3	2	1	2	10
Cloth Presser	0	1	0	0	0	0	0	0	1
Clothier's Machinist	0	0	0	0	1	0	0	0	1
Coach Baize Maker	1	0	0	0	0	0	0	0	1
Cook	0	0	1	2	0	1	2	0	6
Cotton Weaver	0	0	0	1	0	0	0	0	1
Crepe Factory Hand	0	0	0	0	0	0	1	0	1
Domestic	10	8	14	6	12	13	16	6	85
Domestic Servant	9	20	15	13	17	12	16	5	107
Draper's Assistant	0	1	0	1	0	0	0	0	2
Dressmaker	3	6	3	3	4	2	3	4	28
Fancy Shop Asst.	0	0	0	0	0	0	0	1	1
Flock Packer	1	0	0	0	0	0	0	0	1
Fowl Dresser	0	0	0	0	0	1	1	0	2
Fur Cutter	0	0	1	1	1	0	0	2	5
Gauze Weaver	1	0	0	0	0	1	0	0	2
General Servant	2	2	2	1	4	2	1	13	27
Glove Maker	0	0	0	0	1	0	0	0	1
Governess	0	0	0	1	0	1	0	0	2
Hair Drawer/Sorter	2	0	1	1	1	0	1	0	6
Hawker	0	1	0	0	0	0	0	1	2
Hosiery Machinist	0	1	0	0	0	0	0	0	1
Hotel Porter	0	0	0	0	0	1	0	0	1
Housekeeper	1	2	1	5	7	2	3	14	35
Housemaid	0	0	1	0	2	0	2	1	6
Jam Maker	0	0	0	0	0	0	2	0	2
Kitchen Maid	0	0	0	0	0	1	0	0	1
Lady's Maid	1	1	0	0	1	0	1	1	5
Laundress	5	5	4	8	5	6	7	4	44
Licensed Victualler	1	0	0	0	0	0	0	0	1
Lodging Hse. Keeper	2	0	0	1	1	0	0	0	4
Mantle Maker	0	0	0	0	1	0	0	0	1
Milliner	0	0	0	2	2	1	0	1	6
Mustard Packer	0	0	0	0	0	1	0	1	2
Nurse	0	0	2	2	2	0	0	1	7
Paper Sorter	0	0	1	0	0	0	0	1	2

Parlour Maid	0	0	0	0	0	2	0	1	3
Photographer's Asst.	0	0	1	0	0	0	0	0	1
Rag Sorter	0	0	0	0	0	0	1	0	1
Restaurant Asst.	0	0	0	1	0	0	0	0	1
School Mistress	0	1	1	0	0	1	1	1	5
Seamstress	1	0	0	0	0	0	2	0	3
Silk Winder	6	2	2	3	5	3	2	0	23
Stationer's Asst.	0	0	1	0	0	0	0	0	1
Starch Packer	2	1	2	1	0	1	3	0	10
Sugar Packer	0	0	0	0	0	0	0	1	1
Tailoress	9	12	9	13	9	8	10	6	76
Tea Packer	0	0	0	0	1	0	0	0	1
Upholstress	1	0	1	0	1	0	1	0	4
Wood Chopper	0	0	0	0	0	0	0	1	1
Wool Spinner	0	1	0	1	0	1	0	0	3
Worsted Weaver	0	0	0	1	0	0	0	0	1
No Occupation	0	0	0	0	0	0	0	1	1
TOTAL	**73**	**84**	**81**	**86**	**92**	**78**	**97**	**84**	**675**

By Category

1.Domestic Work	**91**	**93**	**94**	**95**	**96**	**97**	**99**	**09**	**ALL**
Chambermaid	0	0	0	0	0	0	0	1	1
Charwoman	6	6	8	2	5	4	8	6	45
Cook	0	0	1	2	0	1	2	0	6
Domestic Servant	9	20	15	13	17	12	16	5	107
Domestic	10	8	14	6	12	13	16	6	85
General Servant	2	2	2	1	4	2	1	13	27
Governess	0	0	0	1	0	1	0	0	2
Housekeeper	1	2	1	5	7	2	3	14	35
Housemaid	0	0	1	0	2	0	2	1	6
Kitchen Maid	0	0	0	0	0	1	0	0	1
Lady's Maid	1	1	0	0	1	0	1	1	5
Parlour Maid	0	0	0	0	0	2	0	1	3
Totals	**29**	**39**	**42**	**30**	**48**	**38**	**49**	**48**	**323**

2. Boot/Shoe Trade	**91**	**93**	**94**	**95**	**96**	**97**	**99**	**09**	**ALL**
Boot/Shoe Fitter	1	3	1	2	0	2	2	1	12
Boot/Shoe Maker	5	6	9	7	3	4	4	4	42
Totals	**6**	**9**	**10**	**9**	**3**	**6**	**6**	**5**	**54**

3.Textiles/Clothing	91	93	94	95	96	97	99	09	ALL
Cloth Presser	0	1	0	0	0	0	0	0	1
Clothier's Machinist	0	0	0	0	1	0	0	0	1
Coach Baize Maker	1	0	0	0	0	0	0	0	1
Cotton Weaver	0	0	0	1	0	0	0	0	1
Crepe Factory Hand	0	0	0	0	0	0	1	0	1
Draper's Assistant	0	1	0	1	0	0	0	0	2
Dressmaker	3	6	3	3	4	2	3	4	28
Gauze Weaver	1	0	0	0	0	1	0	0	2
Glove Maker	0	0	0	0	1	0	0	0	1
Hosiery Machinist	0	1	0	0	0	0	0	0	1
Mantle Maker	0	0	0	0	1	0	0	0	1
Milliner	0	0	0	2	2	1	0	1	6
Seamstress	1	0	0	0	0	0	2	0	3
Silk Winder	6	2	2	3	5	3	2	0	23
Tailoress	9	12	9	13	9	8	10	6	76
Wool Spinner	0	1	0	1	0	1	0	0	3
Worsted Weaver	0	0	0	1	0	0	0	0	1
Totals	**21**	**24**	**14**	**25**	**23**	**16**	**18**	**11**	**152**

4. Manufacturing	91	93	94	95	96	97	99	09	ALL
Bottler	0	0	0	0	0	2	1	0	3
Box Maker	2	0	0	3	1	0	0	0	6
Brewery Hand	0	0	0	0	0	0	1	0	1
Brush Maker	0	2	0	1	0	3	2	0	8
Chocolate Maker	0	1	0	1	3	2	1	2	10
Flock Packer	1	0	0	0	0	0	0	0	1
Hair Drawer/Sorter	2	0	1	1	1	0	1	0	6
Jam Maker	0	0	0	0	0	0	2	0	2
Mustard Packer	0	0	0	0	0	1	0	1	2
Paper Sorter	0	0	1	0	0	0	0	1	2
Rag Sorter	0	0	0	0	0	0	1	0	1
Starch Packer	2	1	2	1	0	1	3	0	10
Sugar Packer	0	0	0	0	0	0	0	1	1
Tea Packer	0	0	0	0	1	0	0	0	1
Upholstress	1	0	1	0	1	0	1	0	4
Total	**8**	**4**	**5**	**7**	**7**	**9**	**13**	**5**	**58**

5. Miscellaneous	91	93	94	95	96	97	99	09	ALL
Asylum Attendant	0	1	0	0	0	0	1	0	2
Barmaid	1	0	0	2	2	0	1	3	9
Fancy Shop Asst.	0	0	0	0	0	0	0	1	1
Fowl Dresser	0	0	0	0	0	1	1	0	2
Fur Cutter	0	0	1	1	1	0	0	2	5
Hawker	0	1	0	0	0	0	0	1	2
Hotel Porter	0	0	0	0	0	1	0	0	1
Laundress	5	5	4	8	5	6	7	4	44
Licensed Victualler	1	0	0	0	0	0	0	0	1
Lodging Hse. Keeper	2	0	0	1	1	0	0	0	4
Nurse	0	0	2	2	2	0	0	1	7
Photographer's Asst.	0	0	1	0	0	0	0	0	1
Restaurant Asst.	0	0	0	1	0	0	0	0	1
School Mistress	0	1	1	0	0	1	1	1	5
Stationer's Asst.	0	0	1	0	0	0	0	0	1
Wood Chopper	0	0	0	0	0	0	0	1	1
No Occupation	0	0	0	0	0	0	0	1	1
Totals	**9**	**8**	**10**	**15**	**11**	**9**	**11**	**15**	**88**

Summary	91	93	94	95	96	97	99	09	ALL
Domestic	29	39	42	30	48	38	49	48	323
Boot/shoe	6	9	10	9	3	6	6	5	54
Textile/clothing	21	24	14	25	23	16	18	11	152
Manufacture	8	4	5	7	7	9	13	5	58
Miscellaneous	9	8	10	15	11	9	11	15	88
Total	**73**	**84**	**81**	**86**	**92**	**79**	**97**	**84**	**675**

By Proportion	1891	93	94	95	96	97	99	1909	All
Domestic	40%	46%	52%	35%	52%	48%	51%	57%	48%
Boot/shoe	8%	11%	12%	10%	3%	8%	6%	6%	8%
Textile/clothing	29%	29%	17%	29%	25%	20%	19%	13%	23%
Manufacture	11%	5%	6%	8%	8%	11%	13%	6%	9%
Miscellaneous	12%	9%	12%	17%	12%	11%	11%	18%	13%

DEATHS	1891	93	94	95	96	97	99	1909	All
Barmaid	1	-	-	1	-	1	1	1	5
Boot/Shoe Fitter	1	2	-	-	-	1	-	1	5
Boot/Shoe Maker	1	1	3	2	1	2	2	-	12
Box Maker	1	-	-	1	-	-	-	-	2
Brush Maker	1	-	-	-	-	-	1	-	2
Charwoman	1	1	4	2	3	2	-	3	16
Chocolate Maker	-	-	1	-	-	1	-	1	3
Cloth presser	-	1	-	-	-	-	-	-	1
Clothiers Machinist	-	-	-	-	1	-	-	-	1
Coach Baize Maker	1	-	-	-	-	-	-	-	1
Domestic	4	3	5	1	4	3	8	2	30
Domestic Servant	5	10	6	-	6	2	5	1	35
Drapers Assistant	-	-	-	1	-	-	-	-	1
Dressmaker	1	2	1	2	-	1	1	-	8
Factory Hand	-	-	-	1	-	-	1	-	2
Flock Packer	1	-	-	-	-	-	-	-	1
Fur Cutter	-	-	1	-	-	-	-	1	2
Gauze Weaver	1	-	-	-	-	-	-	-	1
General Servant	-	-	1	1	-	-	-	1	3
Glove Maker	-	-	-	-	1	-	-	-	1
Governess	-	-	-	-	-	1	-	-	1
Hair Drawer/Sorter	1	-	1	-	-	-	1	-	3
Hawker	-	1	-	-	-	-	-	-	1
Hay Cutter	-	-	-	-	-	-	1	-	1
Housekeeper	-	1	-	1	1	-	1	2	6
Housemaid	-	-	-	-	1	-	-	-	1
Lady's Maid	1	-	-	-	-	-	-	-	1
Laundress	1	3	2	3	2	3	1	-	15
Licensed Victualler	1	-	-	-	-	-	-	-	1
Machinist	-	1	-	-	-	-	-	-	1
Nurse	-	-	1	-	-	-	2	-	3
Nursemaid	-	-	-	-	-	1	-	1	2
Paper Sorter	-	-	1	-	-	-	-	-	1
Parlour maid	-	1	-	-	-	1	-	-	2
Rag Sorter	-	-	-	-	-	-	1	-	1
Schoolmistress	-	1	-	-	-	1	-	-	2
Silk Winder	-	-	-	1	-	-	-	-	1
Spinster	-	-	-	-	-	-	1	-	1
Starch Packer	-	1	1	-	-	-	-	-	2
Tailoress	2	1	4	4	3	4	2	1	21
Upholstress	1	-	-	-	-	-	-	-	1
Widow	-	-	-	-	-	-	-	1	1
TOTAL	**26**	**30**	**32**	**21**	**23**	**24**	**29**	**16**	**201**

BY CATEGORY

1.Domestic Work	**91**	**93**	**94**	**95**	**96**	**97**	**99**	**09**	**ALL**
Charwoman	1	1	4	2	3	2	-	3	16
Domestic Servant	5	10	6	-	6	2	5	1	35
Domestic	4	3	5	1	4	3	8	2	30
General Servant	-	-	1	1	-	-	-	1	3
Governess	0	0	0	0	0	1	0	0	1
Housekeeper	0	1	0	1	1	-	1	2	6
Housemaid	0	0	0	0	1	0	0	0	1
Lady's Maid	1	0	0	0	0	0	0	0	1
Nurse Maid	0	0	0	0	0	1	0	1	2
Parlour Maid	0	1	0	0	0	1	0	0	2
Totals	**11**	**16**	**16**	**5**	**15**	**10**	**14**	**10**	**97**

2. Boot/Shoe Trade	**91**	**93**	**94**	**95**	**96**	**97**	**99**	**09**	**ALL**
Boot/Shoe Fitter	1	-	-	1	-	1	1	1	5
Boot/Shoe Maker	1	1	3	2	1	2	2	-	12
Totals	**2**	**1**	**3**	**3**	**1**	**3**	**3**	**1**	**17**

3.Textiles/Clothing	**91**	**93**	**94**	**95**	**96**	**97**	**99**	**09**	**ALL**
Cloth Presser	0	1	0	0	0	0	0	0	1
Clothier's Machinist	0	0	0	0	1	0	0	0	1
Coach Baize Maker	1	0	0	0	0	0	0	0	1
Draper's Assistant	0	0	0	1	0	0	0	0	1
Dressmaker	1	2	1	2	0	1	1	0	8
Gauze Weaver	1	0	0	0	0	0	0	0	1
Glove Maker	0	0	0	0	1	0	0	0	1
Silk Winder	0	0	0	1	0	0	0	0	1
Tailoress	2	1	4	4	3	4	2	1	21
Totals	**5**	**4**	**5**	**8**	**5**	**5**	**3**	**1**	**36**

4. Manufacturing	**91**	**93**	**94**	**95**	**96**	**97**	**99**	**09**	**ALL**
Box Maker	1	0	0	1	0	0	0	0	2
Brush Maker	1	0	0	0	0	0	1	0	2
Chocolate Maker	0	0	1	0	0	1	0	1	3
Factory Hand	0	0	0	1	0	0	1	0	2
Flock Packer	1	0	0	0	0	0	0	0	1
Hair Drawer/Sorter	1	0	1	0	0	0	1	0	3
Machinist	0	1	0	0	0	0	0	0	1
Paper Sorter	0	0	1	0	0	0	0	0	1
Rag Sorter	0	0	0	0	0	0	1	0	1
Starch Packer	0	1	1	0	0	0	0	0	2
Upholstress	1	0	0	0	0	0	0	0	1
Total	**5**	**2**	**4**	**2**	**0**	**1**	**4**	**1**	**19**

Miscellaneous	**91**	**93**	**94**	**95**	**96**	**97**	**99**	**09**	**ALL**
Barmaid	1	0	0	1	0	1	1	1	5
Fur Cutter	0	0	1	0	0	0	0	1	2
Hawker	0	1	0	0	0	0	0	0	1
Hay Cutter	0	0	0	0	0	0	1	0	1
Laundress	1	3	2	3	2	3	1	0	15
Licensed Victualler	1	0	0	0	0	0	0	0	1
Nurse	0	0	1	0	0	0	2	0	3
School Mistress	0	1	0	0	0	1	0	0	2
Spinster	0	0	0	0	0	0	1	0	1
Widow	0	0	0	0	0	0	0	1	1
Totals	**3**	**5**	**4**	**4**	**2**	**5**	**6**	**3**	**32**

SUMMARY	**91**	**93**	**94**	**95**	**96**	**97**	**99**	**09**	**ALL**
Domestic	11	16	16	5	15	10	14	10	97
Boot/shoe	2	1	3	3	1	3	3	1	17
Textile/clothing	5	4	5	8	5	5	3	1	36
Manufacture	5	2	4	2	0	1	4	1	19
Miscellaneous	3	5	4	4	2	5	6	3	32
Total	**26**	**28**	**32**	**22**	**23**	**24**	**30**	**16**	**201**

BY PROPORTION	**1891**	**93**	**94**	**95**	**96**	**97**	**99**	**1909**	**All**
Domestic	42%	57%	50%	23%	65%	42%	47%	63%	49%
Boot/shoe	8%	4%	9%	14%	4%	12%	10%	6%	8%
Textile/clothing	19%	14%	16%	36%	22%	21%	10%	6%	18%
Manufacture	19%	7%	13%	9%	-	4%	13%	6%	9%
Miscellaneous	12%	18%	13%	18%	9%	21%	20%	19%	16%